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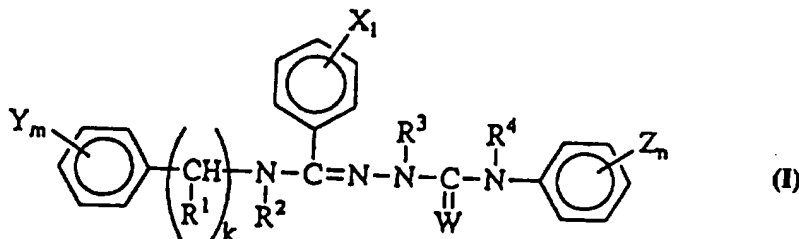
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(54) Title: BENZAMIDE SEMICARBAZONE DERIVATIVES AND THEIR USE AS PESTICIDES

(57) Abstract

A semicarbazone derivative of formula (I), wherein W is an oxygen atom or a sulfur atom; each of X, Y and Z which are independent of one another, is a halogen atom, a hydroxyl group, a cyano group, a nitro group, SCN, a trimethylsilyl group, R⁹, OR⁹, S(O)_pR⁹, OS(O)₂R⁹, OC(O)R⁹, C(O)R⁹, CO₂R⁹, C(O)N(R⁹)R¹⁰, SO₂N(R⁹)R¹⁰, NHC(O)R⁹, N(R⁹)R¹⁰, or -CH=CH-CH=CH-, -OCH₂O-, -OCH₂CH₂O-, -OCF₂O-, -OCF₂CF₂O- or -OCF₂CF₂- bridging the adjacent carbon atoms; R¹ is a hydrogen atom, R⁵, a C₁-alkyl group which may be substituted by R⁵, or a phenyl group which may be substituted by (R⁵)_q; each of R², R³ and R⁴ which are independent of one another, is a hydrogen atom, a C₁-alkyl group, a C₂-alkenyl group, a C₂-alkynyl group, a C₁-haloalkyl group, a C₂-haloalkoxy group, a C₂-alkoxyalkyl group, a C₂-alkoxycarbonyl group, a C₂-haloalkylcarbonyl group, a C₁-alkylthio group, a C₁-haloalkylthio group, R⁶OC(O)N(R⁷)S-, R⁷(R⁸)NS-, or a benzyl group which may be substituted by (R⁵)_q; R⁵ is a halogen atom, a hydroxyl group, a cyano group, a nitro group, a C₁-alkyl group, a C₁-haloalkyl group, a C₁-alkoxy group, a C₁-haloalkoxy group, a C₁-alkylthio group, a C₁-haloalkylthio group, a C₁-alkylsulfonyl group, a C₁-haloalkylsulfonyl group, a C₂-alkoxycarbonyl group, an amino group, or a di C₁-alkylamino group; k is an integer of from 0 to 2, provided that when k is 2, the plurality of R¹ may be the same or different; l is an integer of from 0 to 5, provided that when l is from 2 to 5, the plurality of X may be the same or different; m is an integer of from 0 to 5, provided that when m is from 2 to 5, the plurality of Y may be the same or different; n is an integer of from 1 to 5, provided that when n is from 2 to 5, the plurality of Z may be the same or different. Semicarbazone derivatives of formula (I) exhibit excellent insecticidal activities at a low dose and they are very useful compounds substantially free from adverse effects against mammals, fishes and beneficial insects.



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DESCRIPTION

Benzamide semicarbazone derivatives and their use as pesticides

TECHNICAL FIELD

5 The present invention relates to novel semicarbazone derivatives and pesticides containing such derivatives as active ingredients.

BACKGROUND ART

Heretofore, with respect to semicarbazone derivatives
10 of benzamide, compounds of $4\text{-RC}_6\text{H}_4\text{C}=(\text{NHC}_6\text{H}_4\text{R}'\text{-4})\text{NNHCWNHR}''$
(wherein $\text{R} = \text{H}, \text{MeO}, \text{Me}, \text{Cl}, \text{NO}_2$; $\text{R}' = \text{H}, \text{MeO}, \text{Me}, \text{Cl}$;
 $\text{R}'' = \text{Ph}$; $\text{W} = \text{O}, \text{S}$) have been known in Eur. J. Med. Chem.,
26, 273 (1991). However, here, R'' is limited to an
unsubstituted phenyl group, and the corresponding
15 compounds wherein R'' is a substituted phenyl group are
novel. Further, this literature discloses nothing about
pesticidal activities although it indicates
pharmaceutical activities.

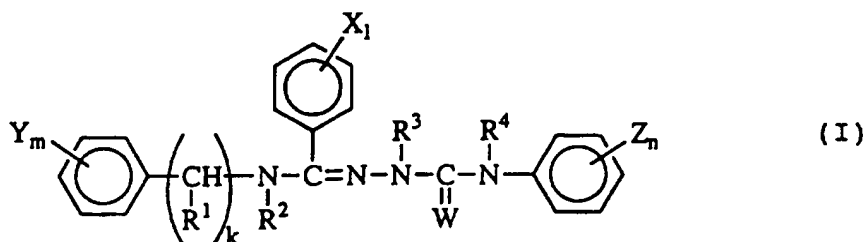
In recent years, insect pests have acquired
20 resistance due to use of insecticides over many years,
and it has become difficult to control them by
conventional insecticides. Further, some of insecticides
have high toxicity, and some of them have residual
toxicity, whereby the ecosystem tends to be disturbed.
25 Accordingly, it is desired to develop a novel insecticide
having a low toxicity and a low residual effect.

DISCLOSURE OF INVENTION

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The present inventors have conducted extensive researches on semicarbazone derivatives and as a result, have found that novel semicarbazone derivatives of benzanilide exhibit excellent insecticidal activities at a low dose, and they are very useful compounds substantially free from adverse effects against mammals, fishes and beneficial insects. The present invention has been accomplished on the basis of these discoveries.

The present invention provides a semicarbazone derivative of the formula (I):



15

wherein W is an oxygen atom or a sulfur atom;

each of X, Y and Z which are independent of one another, is a halogen atom, a hydroxyl group, a cyano group, a nitro group, SCN, a trimethylsilyl group, R⁹, OR⁹, S(O)_pR⁹, OS(O)₂R⁹, OC(O)R⁹, C(O)R⁹, CO₂R⁹, C(O)N(R⁹)R¹⁰, SO₂N(R⁹)R¹⁰, NHC(O)R⁹, N(R⁹)R¹⁰, or -CH=CH-CH=CH-, -OCH₂O-, -OCH₂CH₂O-, -OCF₂O-, -OCF₂CF₂O- or -OCF₂CF₂- bridging the adjacent carbon atoms;

R¹ is a hydrogen atom, R⁵, a C₁₋₆ alkyl group which may be substituted by R⁵, or a phenyl group which may be substituted by (R⁵)_q;

each of R², R³ and R⁴ which are independent of one

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another, is a hydrogen atom, a C₁₋₆ alkyl group, a C₂₋₆ alkenyl group, a C₂₋₆ alkynyl group, a C₁₋₆ haloalkyl group, a C₂₋₆ alkoxyalkyl group, a C₂₋₆ alkylcarbonyl group, a C₂₋₆ alkoxycarbonyl group, a C₂₋₆ haloalkylcarbonyl group, a C₁₋₆ alkylthio group, a C₁₋₆ haloalkylthio group, R⁶OC(O)N(R⁷)S-, R⁷(R⁸)NS-, or a benzyl group which may be substituted by (R⁵)_q;

R⁵ is a halogen atom, a hydroxyl group, a cyano group, a nitro group, a C₁₋₆ alkyl group, a C₁₋₆ haloalkyl group, a C₁₋₆ alkoxy group, a C₁₋₆ haloalkoxy group, a C₁₋₆ alkylthio group, a C₁₋₆ haloalkylthio group, a C₁₋₆ alkylsulfonyl group, a C₁₋₆ haloalkylsulfonyl group, a C₂₋₆ alkoxycarbonyl group, an amino group, or a di C₁₋₆ alkylamino group;

each of R⁶, R⁷ and R⁸ which are independent of one another, is a C₁₋₆ alkyl group, a phenyl group which may be substituted by (R⁵)_q, or a benzyl group which may be substituted by (R⁵)_q;

R⁹ is a C₁₋₆ alkyl group, a C₁₋₆ haloalkyl group, a C₂₋₆ alkenyl group, a C₂₋₆ haloalkenyl group, a C₂₋₆ alkynyl group, a C₂₋₆ haloalkynyl group, a C₃₋₆ cycloalkyl group, a C₃₋₆ halocycloalkyl group, a C₄₋₇ cycloalkylalkyl group, a C₂₋₆ alkoxyalkyl group, a C₂₋₆ alkylthioalkyl group, a C₂₋₆ alkoxycarbonylalkyl group, a C₂₋₆ cyanoalkyl group, a phenyl group which may be substituted by (R⁵)_q, a benzyl group which may be substituted by (R⁵)_q, or a pyridyl group which may be substituted by (R⁵)_r;

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R^{10} is a hydrogen atom, or a C_{1-6} alkyl group;

k is an integer of from 0 to 2, provided that when k is 2, the plurality of R^1 may be the same or different;

5 ℓ is an integer of from 0 to 5, provided that when ℓ is from 2 to 5, the plurality of X may be the same or different;

m is an integer of from 0 to 5, provided that when m is from 2 to 5, the plurality of Y may be the same or different;

10 n is an integer of from 1 to 5, provided that when n is from 2 to 5, the plurality of Z may be the same or different;

p is an integer of from 0 to 2;

15 q is an integer of from 0 to 5, provided that when q is from 2 to 5, the plurality of R^5 may be the same or different; and

r is an integer of from 0 to 4, provided that when r is from 2 to 4, the plurality of R^5 may be the same or different.

20 The present invention also provides a pesticide which contains at least one such semicarbazone derivative as an active ingredient.

Now, specific examples will be given for each substituent disclosed above. The carbon chain in each
25 substituent may be linear, branched or cyclic. In the following description, n- means normal, i- means iso, sec- means secondary, t- means tertiary, and c- means

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cyclo.

The C₁₋₆ alkyl group may, for example, be a methyl group, an ethyl group, a n-propyl group, an i-propyl group, a c-propyl group, a n-butyl group, an i-butyl group, a sec-butyl group, a t-butyl group, a c-butyl group, a n-pentyl group, a c-pentyl group, a n-hexyl group, or a c-hexyl group.

The C₂₋₆ alkenyl group may, for example, be an ethenyl group, a 2-propenyl group, a 2-methyl-2-propenyl group, or a 2-butenyl group.

The C₂₋₆ alkynyl group may, for example, be an ethynyl group, a 2-propynyl group, or a 2-butylnyl group.

The C₂₋₆ alkoxyalkyl group may, for example, be a methoxymethyl group, an ethoxymethyl group, or a 1-methoxyethyl group.

The C₂₋₆ alkylcarbonyl group may, for example, be a methylcarbonyl group, an ethylcarbonyl group, a n-propylcarbonyl group, an i-propylcarbonyl group, a c-propylcarbonyl group, a n-butylcarbonyl group, an i-butylcarbonyl group, a sec-butylcarbonyl group, a t-butylcarbonyl group, or a c-butylcarbonyl group.

The C₂₋₆ alkoxycarbonyl group may, for example, be a methoxycarbonyl group, an ethoxycarbonyl group, a n-propoxycarbonyl group, an i-propoxycarbonyl group, a c-propoxycarbonyl group, a n-butoxycarbonyl group, an i-butoxycarbonyl group, a sec-butoxycarbonyl group, a t-butoxycarbonyl group, or a c-butoxycarbonyl group.

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The halogen atom may be a fluorine atom, a chlorine atom, a bromine atom or an iodine atom.

W is an oxygen atom or a sulfur atom, preferably an oxygen atom.

Each of X, Y and Z which are independent of one another, may, for example, be a halogen atom, a hydroxyl group, a cyano group, a nitro group, SCN, a trimethylsilyl group, a C₁₋₆ alkyl group, a C₁₋₆ haloalkyl group, a C₂₋₆ alkenyl group, a C₂₋₆ haloalkenyl group, a C₂₋₆ alkynyl group, a C₂₋₆ haloalkynyl group, a C₃₋₆ cycloalkyl group, a C₃₋₆ halocycloalkyl group, a C₄₋₇ cycloalkylalkyl group, a C₂₋₆ alkoxyalkyl group, a C₂₋₆ alkylthioalkyl group, a C₂₋₆ alkoxycarbonylalkyl group, a C₂₋₆ cyanoalkyl group, a C₁₋₆ alkoxy group, a C₁₋₆ haloalkoxy group, a C₂₋₆ alkenyloxy group, a C₂₋₆ haloalkenyloxy group, a C₂₋₆ alkynyloxy group, a C₂₋₆ haloalkynyloxy group, a C₃₋₆ cycloalkyloxy group, a C₃₋₆ halocycloalkyloxy group, a C₄₋₇ cycloalkylalkyloxy group, a C₂₋₆ alkoxyalkyloxy group, a C₂₋₆ alkylthioalkyloxy group, a C₃₋₆ alkoxycarbonylalkyloxy group, a C₂₋₆ cyanoalkyloxy group, a C₁₋₆ alkylthio group, a C₁₋₆ haloalkylthio group, a C₂₋₆ alkenylthio group, a C₂₋₆ haloalkenylthio group, a C₂₋₆ alkynylthio group, a C₂₋₆ haloalkynylthio group, a C₃₋₆ cycloalkylthio group, a C₃₋₆ halocycloalkylthio group, a C₄₋₇ cycloalkylalkylthio group, a C₂₋₆ alkoxyalkylthio group, a C₂₋₆ alkylthioalkylthio group, a C₂₋₆ alkoxycarbonylalkylthio

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- group, a C₂₋₆ cyanoalkylthio group, a C₁₋₆ alkylsulfinyl group, a C₁₋₆ haloalkylsulfinyl group, a C₂₋₆ alkenylsulfinyl group, a C₂₋₆ haloalkenylsulfinyl group, a C₂₋₆ alkynylsulfinyl group, a C₂₋₆ haloalkynylsulfinyl group, a C₃₋₆ cycloalkylsulfinyl group, a C₃₋₆ halocycloalkylsulfinyl group, a C₄₋₇ cycloalkylalkylsulfinyl group, a C₂₋₆ alkoxyalkylsulfinyl group, a C₂₋₆ alkylthioalkylsulfinyl group, a C₁₋₆ alkylsulfonyl group, a C₁₋₆ haloalkylsulfonyl group, a C₂₋₆ alkenylsulfonyl group, a C₂₋₆ haloalkenylsulfonyl group, a C₂₋₆ alkynylsulfonyl group, a C₂₋₆ haloalkylsulfonyl group, a C₃₋₆ cycloalkylsulfonyl group, a C₃₋₆ halocycloalkylsulfonyl group, a C₄₋₇ cycloalkylalkylsulfonyl group, a C₂₋₆ alkoxyalkylsulfonyl group, a C₂₋₆ alkylthioalkylsulfonyl group, a C₂₋₆ alkoxycarbonylalkylsulfonyl group, a C₂₋₆ cyanoalkylsulfonyl group, a C₁₋₆ alkylsulfonyloxy group, a C₁₋₆ haloalkylsulfonyloxy group, a C₃₋₆ cycloalkylsulfonyloxy group, a C₃₋₆ halocycloalkylsulfonyloxy group, a C₂₋₆ cyanoalkylsulfonyloxy group, a C₂₋₇ alkylcarbonyloxy group, a C₂₋₇ haloalkylcarbonyloxy group, a C₄₋₇ cycloalkylcarbonyloxy group, a C₄₋₇ halocycloalkylcarbonyloxy group, a C₃₋₇ cyanoalkylcarbonyloxy group, a C₂₋₇ alkylcarbonyl group, a C₂₋₇ haloalkylcarbonyl group, a C₄₋₇ cycloalkylcarbonyl group, a C₄₋₇ halocycloalkylcarbonyl group, a C₃₋₇

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- cyanoalkylcarbonyl group, a C₂₋₇ alkoxycarbonyl group, a C₂₋₇ haloalkoxycarbonyl group, a C₄₋₇ cycloalkyloxycarbonyl group, a C₄₋₇ halocycloalkyloxycarbonyl group, a C₃₋₇
- 5 cyanoalkyloxycarbonyl group, a mono C₁₋₆ alkylaminocarbonyl group, a mono C₁₋₆ haloalkylaminocarbonyl group, a di C₁₋₆ alkylaminocarbonyl group, a di C₁₋₆ haloalkylaminocarbonyl group, a mono C₁₋₆
- 10 alkylaminosulfonyl group, a mono C₁₋₆ haloalkylaminosulfonyl group, a di C₁₋₆ alkylaminosulfonyl group, a di C₁₋₆ haloalkylaminosulfonyl group, an aminocarbonyl group, an aminosulfonyl group, a formylamino group, a C₂₋₇
- 15 alkylcarbonylamino group, a C₂₋₇ haloalkylcarbonylamino group, an amino group, a mono C₁₋₆ alkylamino group, a mono C₁₋₆ haloalkylamino group, a di C₁₋₆ alkylamino group, a di C₁₋₆ haloalkylamino group,
- CH=CH-CH=CH-, -OCH₂O-, -OCH₂CH₂O-, -OCF₂O-, -OCF₂CF₂O- or
- 20 -OCF₂CF₂- bridging the adjacent carbon atoms, a phenyl group which may be substituted, a phenoxy group which may be substituted, a phenylthio group which may be substituted, a phenylsulfinyl group which may be substituted, a phenylsulfonyl group which may be
- 25 substituted, a phenylsulfonyloxy group which may be substituted, a phenylcarbonyloxy group which may be substituted, a phenylcarbonyl group which may be

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substituted, a phenoxycarbonyl group which may be
substituted, a phenylaminocarbonyl group which may be
substituted, a phenylsulfonylcamino group which may be
substituted, a phenylcarbonylamino group which may be
5 substituted, a phenylamino group which may be
substituted, a benzyl group which may be substituted, a
benzyloxy group which may be substituted, a benzylthio
group which may be substituted, a benzylsulfinyl group
which may be substituted, a benzylsulfonyl group which
10 may be substituted, a benzylsulfonyloxy group which may
be substituted, a benzylcarbonyloxy group which may be
substituted, a benzylcarbonyl group which may be
substituted, a benzyloxycarbonyl group which may be
substituted, a benzylaminocarbonyl group which may be
15 substituted, a benzylsulfonylamino group which may be
substituted, a benzylcarbonylamino group which may be
substituted, a benzylamino group which may be
substituted, a pyridyl group which may be substituted, a
pyridyloxy group which may be substituted, a pyridylthio
20 group which may be substituted, a pyridylsulfinyl group
which may be substituted, a pyridylsulfonyl group which
may be substituted, a pyridylsulfonyloxy group which may
be substituted, a pyridylcarbonyloxy group which may be
substituted, a pyridylcarbonyl group which may be
25 substituted, a pyridyloxycarbonyl group which may be
substituted, a pyridylaminocarbonyl group which may be
substituted, a pyridnysulfonylamino group which may be

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substituted, a pyridylcarbonylamino group which may be substituted, or a pyridylamino group which may be substituted (provided that the substituent for each group which may be substituted, may, for example, be a halogen atom, a hydroxyl group, a cyano group, a nitro group, a C₁₋₆ alkyl group, a C₁₋₆ haloalkyl group, a C₁₋₆ alkylthio group, a C₁₋₆ haloalkylthio group, a C₁₋₆ alkylsulfonyl group, a C₁₋₆ haloalkylsulfonyl group, a C₁₋₆ alkoxycarbonyl group, an amino group, or a di C₁₋₆ alkylamino group).

X may preferably be, for example, a halogen atom, a cyano group, a nitro group, a C₁₋₆ alkyl group, a C₁₋₆ haloalkyl group, a C₁₋₆ alkoxy group, a C₁₋₆ haloalkoxy group, a C₁₋₆ haloalkylthio group, a C₁₋₆ haloalkylsulfonyloxy group, or a C₂₋₆ alkoxycarbonyl group.

X is preferably substituted at the 3-position, the 4-position and/or the 5-position, preferably at the 3-position.

Y may preferably be, for example, a halogen atom, a cyano group, a nitro group, a C₁₋₆ alkyl group, a C₁₋₆ haloalkyl group, a C₁₋₆ alkoxy group, a C₂₋₆ alkoxycarbonyl group, a C₁₋₆ haloalkoxy group, a C₁₋₆ alkylthio group, a C₁₋₆ haloalkylthio group, a C₁₋₆ alkylsulfonyl group, a C₁₋₆ haloalkylsulfonyl group, a C₁₋₆ alkylsulfonyloxy group, a C₁₋₆ haloalkylsulfonyloxy group, or -OCF₂O- or -OCF₂CF₂O- bridging the adjacent

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carbon atoms.

Y is preferably substituted at the 3-position, the 4-position and/or the 5-position, more preferably at the 4-position.

5 Z may preferably be, for example, a halogen atom, a cyano group, a nitro group, a C₁₋₆ alkyl group, a C₁₋₆ haloalkyl group, a C₁₋₆ haloalkoxy group, a C₁₋₆ alkylthio group, a C₁₋₆ haloalkylthio group, a C₁₋₆ alkylsulfinyl group, a C₁₋₆ haloalkylsulfinyl group, a C₁₋₆ alkylsulfonyl group,
10 alkylsulfonyl group, a C₁₋₆ haloalkylsulfonyl group, a C₁₋₆ alkylsulfonyloxy group, a C₁₋₆ haloalkylsulfonyloxy group, or -OCF₂O-, -OCF₂CF₂O- or -OCF₂CF₂- bridging the adjacent carbon atoms.

 Z is preferably substituted at the 3-position and/or
15 the 4-position, more preferably at the 4-position.

 R¹ may, for example, be a halogen atom, a hydroxyl group, a cyano group, a nitro group, a C₁₋₆ alkyl group, a C₁₋₆ haloalkyl group, a C₁₋₆ alkoxy group, a C₁₋₆ haloalkoxy group, a C₁₋₆ alkylthio group, a C₁₋₆ haloalkylthio group, a C₁₋₆ alkylsulfonyl group, a C₁₋₆ haloalkylsulfonyl group, a C₂₋₆ alkoxycarbonyl group, an
20 amino group, a di C₁₋₆ alkylamino group, or a phenyl group which may be substituted (provided that the substituent for the group which may be substituted, may,
25 for example, be a halogen atom, a hydroxyl group, a cyano group, a nitro group, a C₁₋₆ alkyl group, a C₁₋₆ haloalkyl group, a C₁₋₆ alkoxy group, a C₁₋₆ haloalkoxy group, a

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C₁₋₆ alkylthio group, a C₁₋₆ haloalkylthio group, a C₁₋₆ alkylsulfonyl group, a C₂₋₆ alkoxy carbonyl group, an amino group, or a di C₁₋₆ alkylamino group).

R¹ is preferably a hydrogen atom, or a C₁₋₆ alkyl group.

Each of R², R³ and R⁴ may, for example, be a hydrogen atom, a C₁₋₆ alkyl group, a C₂₋₆ alkenyl group, a C₂₋₆ alkynyl group, a C₁₋₆ haloalkyl group, a C₂₋₆ alkoxyalkyl group, a C₂₋₆ alkylcarbonyl group, a C₂₋₆ alkoxy carbonyl group, a C₂₋₆ haloalkylcarbonyl group, a C₁₋₆ alkylthio group, a C₁₋₆ haloalkylthio group, a C₂₋₁₂ dialkylaminothio group, a C₃₋₁₂ (alkyl)alkoxy carbonylaminothio group, or a benzyl group which may be substituted (provided that the substituent for the group which may be substituted, may, for example, be a halogen atom, a hydroxyl group, a cyano group, a nitro group, a C₁₋₆ alkyl group, a C₁₋₆ haloalkyl group, a C₁₋₆ alkoxy group, a C₁₋₆ haloalkoxy group, a C₁₋₆ alkylthio group, a C₁₋₆ haloalkylthio group, a C₁₋₆ alkylsulfonyl group, a C₂₋₆ alkoxy carbonyl group, an amino group, or a di C₁₋₆ alkylamino group).

R² may preferably be, for example, a hydrogen atom, a C₁₋₆ alkyl group, a C₂₋₆ alkenyl group, a C₂₋₆ alkynyl group, a C₁₋₆ haloalkyl group, a C₂₋₆ alkoxyalkyl group, a C₂₋₆ alkylcarbonyl group, a C₂₋₆ alkoxy carbonyl group, a C₂₋₆ haloalkylcarbonyl group, a C₁₋₆ alkylthio group, a C₁₋₆ haloalkylthio group, R⁶OC(O)N(R⁷)S-, R⁷(R⁸)NS-, or a

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benzyl group which may be substituted by $(R^5)_q$.

Each of R^3 and R^4 is preferably a hydrogen atom or a C_{1-6} alkyl group.

k is preferably an integer of from 0 to 2, more
5 preferably 0.

ℓ is preferably an integer of from 0 to 2, more preferably 1.

m is preferably an integer of from 0 to 2, more preferably 1.

10 n is preferably an integer of from 1 to 3, more preferably 1.

The following compounds may be mentioned as preferred compounds of the present invention.

(1) The semicarbazone derivative of the formula (I)
15 wherein

X is a halogen atom, a cyano group, a nitro group, a C_{1-6} alkyl group, a C_{1-6} haloalkyl group, a C_{1-6} alkoxy group, a C_{1-6} haloalkoxy group, a C_{1-6} haloalkylthio group, a C_{1-6} haloalkylsulfonyloxy group, or a C_{2-6}
20 alkoxycarbonyl group;

Y is a halogen atom, a cyano group, a nitro group, a C_{1-6} alkyl group, a C_{1-6} haloalkyl group, a C_{1-6} alkoxy group, a C_{2-6} alkoxycarbonyl group, a C_{1-6} haloalkoxy group, a C_{1-6} alkylthio group, a C_{1-6} haloalkylthio group,
25 a C_{1-6} alkylsulfonyl group, a C_{1-6} haloalkylsulfonyl group, a C_{1-6} alkylsulfonyloxy group, a C_{1-6} haloalkylsulfonyloxy group, or $-OCF_2O-$ or $-OCF_2CF_2O-$

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bridging the adjacent carbon atoms;

5 Z is a halogen atom, a cyano group, a nitro group, a C₁₋₆ alkyl group, a C₁₋₆ haloalkyl group, a C₁₋₆ haloalkoxy group, a C₁₋₆ alkylthio group, a C₁₋₆ haloalkylthio group, a C₁₋₆ alkylsulfinyl group, a C₁₋₆ haloalkylsulfinyl group, a C₁₋₆ alkylsulfonyl group, a C₁₋₆ haloalkylsulfonyl group, a C₁₋₆ alkylsulfonyloxy group, a C₁₋₆ haloalkylsulfonyloxy group, or -OCF₂O-, -OCF₂CF₂O- or -OCF₂CF₂- bridging the adjacent carbon
10 atoms;

each of R¹, R³ and R⁴ which are independent of one another, is a hydrogen atom or a C₁₋₆ alkyl group;

15 R² is a hydrogen atom, a C₁₋₆ alkyl group, a C₂₋₆ alkenyl group, a C₂₋₆ alkynyl group, a C₁₋₆ haloalkyl group, a C₂₋₆ alkoxyalkyl group, a C₂₋₆ alkylcarbonyl group, a C₂₋₆ alkoxycarbonyl group, a C₂₋₆ haloalkylcarbonyl group, a C₁₋₆ alkylthio group, a C₁₋₆ haloalkylthio group, R⁶OC(O)N(R⁷)S-, R⁷(R⁸)NS-, or a benzyl group which may be substituted by (R⁵)_q;

20 each of *l* and *m* which are independent of each other, is an integer of from 0 to 2; and

n is an integer of from 1 to 3.

(2) The semicarbazone derivative of the above (1) wherein

25 X is a halogen atom, a cyano group, a nitro group, a C₁₋₆ alkyl group, a C₁₋₆ haloalkyl group, a C₁₋₆ alkoxy group, a C₁₋₆ haloalkoxy group, or a C₂₋₆ alkoxycarbonyl

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group, and it is substituted at the 3-position, the 4-position, the 3- and 4-positions, or the 3- and 5-positions;

Y is a halogen atom, a cyano group, a nitro group, a
5 C₁₋₆ alkyl group, a C₁₋₆ haloalkyl group, a C₁₋₆ alkoxy group, a C₁₋₆ haloalkoxy group, a C₁₋₆ alkylthio group, a C₁₋₆ haloalkylthio group, a C₂₋₆ alkoxycarbonyl group, or a C₁₋₆ alkylsulfonyloxy group, and it is substituted at the 3-position, the 4-position or the 3- and 4-positions;
10 and

Z is a halogen atom, a cyano group, a C₁₋₆ alkyl group, a C₁₋₆ haloalkyl group, a C₁₋₆ alkoxy group, a C₁₋₆ haloalkoxy group, a C₁₋₆ alkylthio group, a C₁₋₆ haloalkylthio group, or a C₁₋₆ alkylsulfonyloxy group,
15 and it is substituted at the 3-position, the 4-position or the 3- and 4-positions;

R² is a hydrogen atom;

each of R³ and R⁴ which are independent of each other, is a hydrogen atom, or a C₁₋₆ alkyl group;

20 k is 0;

each of ℓ and m which are independent of each other, is an integer of from 0 to 2; and

n is 1.

(3) The semicarbazone derivative of the above (1)
25 wherein

X is a halogen atom, a cyano group, a nitro group, a C₁₋₆ alkyl group, a C₁₋₆ haloalkyl group, a C₁₋₆ alkoxy

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group, a C₁₋₆ haloalkoxy group, or a C₂₋₆ alkoxy carbonyl group, and it is substituted at the 3-position, the 4-position, the 3- and 4-positions, or the 3- and 5-positions;

5 Y is a halogen atom, a cyano group, a nitro group, a C₁₋₆ alkyl group, a C₁₋₆ haloalkyl group, a C₁₋₆ alkoxy group, a C₁₋₆ haloalkoxy group, a C₁₋₆ alkylthio group, a C₁₋₆ haloalkylthio group, a C₂₋₆ alkoxy carbonyl group, or a C₁₋₆ alkylsulfonyloxy group, and it is substituted at
10 the 3-position, the 4-position, or the 3- and 4-positions;

 Z is a halogen atom, a cyano group, a C₁₋₆ alkyl group, a C₁₋₆ haloalkyl group, a C₁₋₆ alkoxy group, a C₁₋₆ haloalkoxy group, a C₁₋₆ alkylthio group, a C₁₋₆
15 haloalkylthio group, or a C₁₋₆ alkylsulfonyloxy group, and it is substituted at the 3-position, the 4-position, or the 3- and 4-positions;

 R² is a C₁₋₆ alkyl group, a C₂₋₆ alkenyl group, a C₂₋₆ alkynyl group, a C₁₋₆ haloalkyl group, a C₂₋₆ alkoxyalkyl group, a C₂₋₆ alkylcarbonyl group, a C₂₋₆ alkoxy carbonyl
20 group, a C₂₋₆ haloalkylcarbonyl group, a C₁₋₆ alkylthio group, a C₁₋₆ haloalkylthio group, R⁶OC(O)N(R⁷)S-, R⁷(R⁸)NS-, or a benzyl group which may be substituted by (R⁵)_q;

25 each of R³ and R⁴ which are independent of each other, is a hydrogen atom, or a C₁₋₆ alkyl group;

 k is 0;

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each of ℓ and m which are independent of each other,
is an integer of from 0 to 2; and

n is 1.

(4) The semicarbazone derivative of the above (2)

5 wherein

W is an oxygen atom;

X is a halogen atom, a C_{1-6} alkyl group, a C_{1-6}
haloalkyl group, a C_{1-6} alkoxy group, or a C_{1-6} haloalkoxy
group, and it is substituted at the 3-position;

10 Y is a halogen atom, a cyano group, a nitro group, a
 C_{1-6} haloalkyl group, a C_{1-6} haloalkoxy group, or a C_{1-6}
haloalkylthio group, and it is substituted at the 4-
position;

Z is a halogen atom, a C_{1-6} haloalkyl group, a C_{1-6}
15 haloalkoxy group, or a C_{1-6} haloalkylthio group, and it
is substituted at the 4-position;

each of R^3 and R^4 is a hydrogen atom;

k is 0; and

each of ℓ , m and n is 1.

20 (5) The semicarbazone derivative of the above (3)

wherein

W is an oxygen atom;

X is a halogen atom, a C_{1-6} alkyl group, a C_{1-6}
haloalkyl group, a C_{1-6} alkoxy group, or a C_{1-6} haloalkoxy
25 group, and it is substituted at the 3-position;

Y is a halogen atom, a cyano group, a nitro group, a
 C_{1-6} haloalkyl group, a C_{1-6} haloalkoxy group, or a C_{1-6}

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haloalkylthio group, and it is substituted at the 4-position;

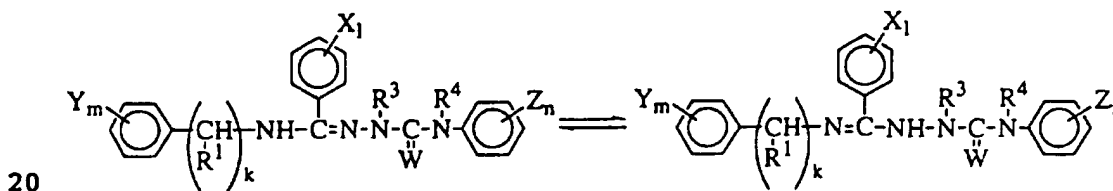
Z is a halogen atom, a C₁₋₆ haloalkyl group, a C₁₋₆ haloalkoxy group, or a C₁₋₆ haloalkylthio group, and it
5 is substituted at the 4-position;

each of R³ and R⁴ is a hydrogen atom;

k is 0; and

each of *l*, m and n is 1.

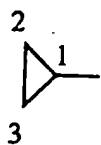
When the compound of the present invention has an
10 asymmetric carbon atom, it includes optically active compounds of (+)-form and (-)-form. Further, when stereoisomerism is present, it includes cis-form and trans-form. Furthermore, when R² is a hydrogen atom, the compound of the present invention may be in the form of
15 the following tautomers, and such structures are also covered by the present invention.



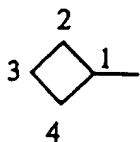
Specific examples of the compound of the present invention include the compounds shown in Table 1. However, the compounds in Table 1 are merely
25 illustrative, and the present invention is by no means limited to such specific examples.

Q1 to Q7 in Table 1 represent the following formulas:

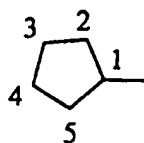
- 19 -



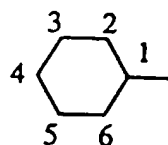
Q1



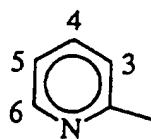
Q2



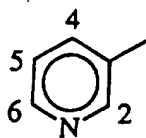
Q3



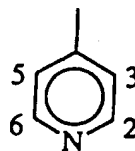
Q4



Q5



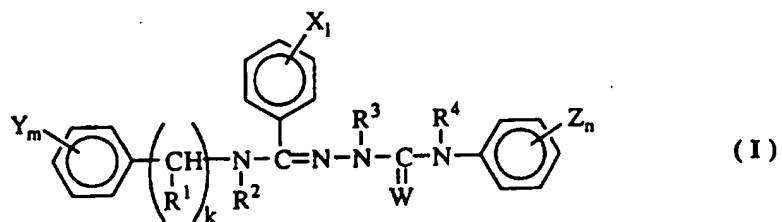
Q6



Q7

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Table 1



k	R ¹	R ²	R ³	R ⁴	W	X ₁	Y _m	Z _n
0		H	H	H	O	3-F	4-F	2-F
0		H	H	H	O	3-F	4-F	3-F
0		H	H	H	O	3-F	4-F	4-F
0		H	H	H	O	3-F	4-F	2-Cl
0		H	H	H	O	3-F	4-F	3-Cl
0		H	H	H	O	3-F	4-F	4-Cl
0		H	H	H	O	3-F	4-F	3-Br
0		H	H	H	O	3-F	4-F	4-Br
0		H	H	H	O	3-F	4-F	4-I
0		H	H	H	O	3-F	4-F	4-CH ₃
0		H	H	H	O	3-F	4-F	4-CH ₂ CH ₃
0		H	H	H	O	3-F	4-F	4-CH(CH ₃) ₂
0		H	H	H	O	3-F	4-F	4-CH ₂ CH ₂ CH ₂ CH ₃
0		H	H	H	O	3-F	4-F	4-C(CH ₃) ₃
0		H	H	H	O	3-F	4-F	4-CH ₂ CH=CH ₂
0		H	H	H	O	3-F	4-F	4-C≡CH
0		H	H	H	O	3-F	4-F	4-CH ₂ C≡CH
0		H	H	H	O	3-F	4-F	4-Q1
0		H	H	H	O	3-F	4-F	4-Q2
0		H	H	H	O	3-F	4-F	4-Q3
0		H	H	H	O	3-F	4-F	4-Q4
0		H	H	H	O	3-F	4-F	4-CHF ₂
0		H	H	H	O	3-F	4-F	4-CH ₂ Br
0		H	H	H	O	3-F	4-F	4-CH ₂ Cl
0		H	H	H	O	3-F	4-F	2-CF ₃
0		H	H	H	O	3-F	4-F	3-CF ₃
0		H	H	H	O	3-F	4-F	4-CF ₃
0		H	H	H	O	3-F	4-F	4-CH ₂ CH=CHCl
0		H	H	H	O	3-F	4-F	4-CH=C(Cl)CF ₃
0		H	H	H	O	3-F	4-F	4-CH ₂ C≡CBr
0		H	H	H	O	3-F	4-F	4-(Q4-1-Cl)
0		H	H	H	O	3-F	4-F	4-CH ₂ CN
0		H	H	H	O	3-F	4-F	4-CH ₂ CH(CH ₃)CN

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k	R ¹	R ²	R ³	R ⁴	W	X ₁	Y _m	Z _n
0	H	H	H	H	O	3-F	4-F	4-CH ₂ OH
0	H	H	H	H	O	3-F	4-F	4-CH ₂ CO ₂ H
0	H	H	H	H	O	3-F	4-F	4-OCH ₃
0	H	H	H	H	O	3-F	4-F	4-OCH ₂ CH ₃
0	H	H	H	H	O	3-F	4-F	4-OCH(CH ₃) ₂
0	H	H	H	H	O	3-F	4-F	4-OC(CH ₃) ₃
0	H	H	H	H	O	3-F	4-F	4-OCH ₂ CH=CH ₂
0	H	H	H	H	O	3-F	4-F	4-OCH ₂ C≡CH
0	H	H	H	H	O	3-F	4-F	4-O(Q4)
0	H	H	H	H	O	3-F	4-F	4-OCHF ₂
0	H	H	H	H	O	3-F	4-F	4-OCF ₂ Br
0	H	H	H	H	O	3-F	4-F	2-OCF ₃
0	H	H	H	H	O	3-F	4-F	3-OCF ₃
0	H	H	H	H	O	3-F	4-F	4-OCF ₃
0	H	H	H	H	O	3-F	4-F	4-OCH ₂ CF ₃
0	H	H	H	H	O	3-F	4-F	4-OCF ₂ CF ₃
0	H	H	H	H	O	3-F	4-F	4-OCF ₂ CHF ₂
0	H	H	H	H	O	3-F	4-F	4-OCF ₂ CHCl ₂
0	H	H	H	H	O	3-F	4-F	4-OCF ₂ CHFC1
0	H	H	H	H	O	3-F	4-F	4-OCF ₂ CHFBBr
0	H	H	H	H	O	3-F	4-F	4-OCF ₂ CF ₂ CF ₃
0	H	H	H	H	O	3-F	4-F	4-OCH ₂ CH=CHCl
0	H	H	H	H	O	3-F	4-F	4-OCH ₂ C≡CBr
0	H	H	H	H	O	3-F	4-F	4-O(Q4-2,2-Cl ₂)
0	H	H	H	H	O	3-F	4-F	4-SCH ₃
0	H	H	H	H	O	3-F	4-F	4-SCH ₂ CH=CH ₂
0	H	H	H	H	O	3-F	4-F	4-SCH ₂ C≡CH
0	H	H	H	H	O	3-F	4-F	4-S(Q4)
0	H	H	H	H	O	3-F	4-F	4-SCHF ₂
0	H	H	H	H	O	3-F	4-F	4-SCF ₂ Br
0	H	H	H	H	O	3-F	4-F	4-SCF ₃
0	H	H	H	H	O	3-F	4-F	4-SOCH ₃
0	H	H	H	H	O	3-F	4-F	4-SOCH ₂ CH=CH ₂
0	H	H	H	H	O	3-F	4-F	4-SOCH ₂ C≡CH
0	H	H	H	H	O	3-F	4-F	4-SO(Q4)
0	H	H	H	H	O	3-F	4-F	4-SOCF ₃
0	H	H	H	H	O	3-F	4-F	4-SO ₂ CH ₃
0	H	H	H	H	O	3-F	4-F	4-SO ₂ CH ₂ CH=CH ₂
0	H	H	H	H	O	3-F	4-F	4-SO ₂ CH ₂ C≡CH
0	H	H	H	H	O	3-F	4-F	4-SO ₂ (Q4)
0	H	H	H	H	O	3-F	4-F	4-SO ₂ CF ₃
0	H	H	H	H	O	3-F	4-F	4-CH ₂ OCH ₃

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k	R ¹	R ²	R ³	R ⁴	W	X ₁	Y _m	Z _n
0	H	H	H	H	O	3-F	4-F	4-OCH ₂ CH ₂ OCH ₃
0	H	H	H	H	O	3-F	4-F	4-CH ₂ OCH ₂ CF ₃
0	H	H	H	H	O	3-F	4-F	4-OCF ₂ CHFOCF ₃
0	H	H	H	H	O	3-F	4-F	4-CH ₂ SCH ₃
0	H	H	H	H	O	3-F	4-F	4-OCH ₂ CH ₂ SCH ₃
0	H	H	H	H	O	3-F	4-F	4-CH ₂ CO ₂ CH ₃
0	H	H	H	H	O	3-F	4-F	4-CH ₂ CO ₂ CH ₂ CF ₃
0	H	H	H	H	O	3-F	4-F	4-CH ₂ COCH ₃
0	H	H	H	H	O	3-F	4-F	4-OCO ₂ CH ₃
0	H	H	H	H	O	3-F	4-F	4-OCOCH ₃
0	H	H	H	H	O	3-F	4-F	4-COCH ₃
0	H	H	H	H	O	3-F	4-F	4-COCH ₂ CH=CH ₂
0	H	H	H	H	O	3-F	4-F	4-COCH ₂ C≡CH
0	H	H	H	H	O	3-F	4-F	4-CO(Q3)
0	H	H	H	H	O	3-F	4-F	4-COCF ₃
0	H	H	H	H	O	3-F	4-F	4-CO ₂ CH ₂ CH ₃
0	H	H	H	H	O	3-F	4-F	4-CO ₂ C(CH ₃) ₃
0	H	H	H	H	O	3-F	4-F	4-CO ₂ CH ₂ CF ₃
0	H	H	H	H	O	3-F	4-F	4-OCH ₂ CO ₂ CH ₃
0	H	H	H	H	O	3-F	4-F	4-NO ₂
0	H	H	H	H	O	3-F	4-F	4-CN
0	H	H	H	H	O	3-F	4-F	4-OH
0	H	H	H	H	O	3-F	4-F	4-CO ₂ H
0	H	H	H	H	O	3-F	4-F	4-SCN
0	H	H	H	H	O	3-F	4-F	4-OSO ₂ CH ₃
0	H	H	H	H	O	3-F	4-F	4-CSCH ₃
0	H	H	H	H	O	3-F	4-F	4-NH ₂
0	H	H	H	H	O	3-F	4-F	4-N(CH ₃) ₂
0	H	H	H	H	O	3-F	4-F	4-N(CH ₃)CH ₂ CH ₃
0	H	H	H	H	O	3-F	4-F	4-N(CH ₃)CH ₂ CH=CH ₂
0	H	H	H	H	O	3-F	4-F	4-N(CH ₃)CH ₂ C≡CH
0	H	H	H	H	O	3-F	4-F	4-N(CH ₃)CH ₂ C ₆ H ₅
0	H	H	H	H	O	3-F	4-F	4-CON(CH ₃) ₂
0	H	H	H	H	O	3-F	4-F	4-OCN(CH ₃) ₂
0	H	H	H	H	O	3-F	4-F	4-NHCOCH ₃
0	H	H	H	H	O	3-F	4-F	4-NHCSCH ₃
0	H	H	H	H	O	3-F	4-F	4-SO ₂ N(CH ₃) ₂
0	H	H	H	H	O	3-F	4-F	4-Si(CH ₃) ₃
0	H	H	H	H	O	3-F	4-F	4-C ₆ H ₅
0	H	H	H	H	O	3-F	4-F	4-(C ₆ H ₄ -4-Cl)
0	H	H	H	H	O	3-F	4-F	4-OC ₆ H ₅
0	H	H	H	H	O	3-F	4-F	4-O(C ₆ H ₄ -4-CF ₃)

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k	R ¹	R ²	R ³	R ⁴	W	X ₁	Y _m	Z _n
0	H	H	H	H	O	3-F	4-F	4-O(C ₆ H ₄ -4-OCF ₃)
0	H	H	H	H	O	3-F	4-F	4-O(C ₆ H ₃ -2,4-F ₂)
0	H	H	H	H	O	3-F	4-F	4-O(C ₆ H ₃ -3,5-Cl ₂)
0	H	H	H	H	O	3-F	4-F	3-O(C ₆ H ₄ -4-CF ₃)
0	H	H	H	H	O	3-F	4-F	4-S(C ₆ H ₃ -2-Cl-4-CF ₃)
0	H	H	H	H	O	3-F	4-F	4-SO ₂ C ₆ H ₅
0	H	H	H	H	O	3-F	4-F	4-NH(C ₆ H ₃ -2-Cl-4-CF ₃)
0	H	H	H	H	O	3-F	4-F	4-N(CH ₂ CH ₃)(C ₆ H ₄ -4-Cl)
0	H	H	H	H	O	3-F	4-F	4-CH ₂ C ₆ H ₅
0	H	H	H	H	O	3-F	4-F	4-CF ₂ (C ₆ H ₄ -4-Br)
0	H	H	H	H	O	3-F	4-F	4-COC ₆ H ₅
0	H	H	H	H	O	3-F	4-F	4-OCH ₂ (C ₆ H ₄ -4-CF ₃)
0	H	H	H	H	O	3-F	4-F	4-CH ₂ OC ₆ H ₅
0	H	H	H	H	O	3-F	4-F	4-NHCH ₂ C ₆ H ₅
0	H	H	H	H	O	3-F	4-F	4-CH ₂ CH ₂ C ₆ H ₅
0	H	H	H	H	O	3-F	4-F	4-CH=CH(C ₆ H ₃ -2,4-Cl ₂)
0	H	H	H	H	O	3-F	4-F	4-N=NC ₆ H ₅
0	H	H	H	H	O	3-F	4-F	4-OCH ₂ CH ₂ C ₆ H ₅
0	H	H	H	H	O	3-F	4-F	4-NHCON(CH ₃)(C ₆ H ₄ -4-Cl)
0	H	H	H	H	O	3-F	4-F	4-OCH ₂ CH ₂ OC ₆ H ₅
0	H	H	H	H	O	3-F	4-F	4-NHCSNHC ₆ H ₅
0	H	H	H	H	O	3-F	4-F	2,4-F ₂
0	H	H	H	H	O	3-F	4-F	3,5-F ₂
0	H	H	H	H	O	3-F	4-F	2,3-Cl ₂
0	H	H	H	H	O	3-F	4-F	2,4-Cl ₂
0	H	H	H	H	O	3-F	4-F	2,5-Cl ₂
0	H	H	H	H	O	3-F	4-F	2,6-Cl ₂
0	H	H	H	H	O	3-F	4-F	3,4-Cl ₂
0	H	H	H	H	O	3-F	4-F	3,5-Cl ₂
0	H	H	H	H	O	3-F	4-F	3,4-Br ₂
0	H	H	H	H	O	3-F	4-F	2,4-I ₂
0	H	H	H	H	O	3-F	4-F	2,4-(CH ₃) ₂
0	H	H	H	H	O	3-F	4-F	3,4-(OCH ₃) ₂
0	H	H	H	H	O	3-F	4-F	2-F-4-Cl
0	H	H	H	H	O	3-F	4-F	2-F-4-Br
0	H	H	H	H	O	3-F	4-F	2-F-4-OCH(CH ₃) ₂
0	H	H	H	H	O	3-F	4-F	2-F-4-OCHF ₂
0	H	H	H	H	O	3-F	4-F	2-F-4-OCF ₃
0	H	H	H	H	O	3-F	4-F	2-F-4-OCF ₂ CHF ₂
0	H	H	H	H	O	3-F	4-F	2-F-4-OCF ₂ CHFCF ₃
0	H	H	H	H	O	3-F	4-F	2-F-4-OCF ₂ CHFCF ₃
0	H	H	H	H	O	3-F	4-F	2-F-4-OCF ₂ CHFOCF ₃

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k	R ¹	R ²	R ³	R ⁴	W	X ₁	Y _m	Z _n
0	H	H	H	H	O	3-F	4-F	2-F-4-SO ₂ CF ₂ CHFCl
0	H	H	H	H	O	3-F	4-F	2-F-4-O(C ₆ H ₄ -4-Cl)
0	H	H	H	H	O	3-F	4-F	2-F-4-O(Q5-3-Cl-5-CF ₃)
0	H	H	H	H	O	3-F	4-F	3-F-4-O(Q5-3-Cl-5-CF ₃)
0	H	H	H	H	O	3-F	4-F	2-Cl-4-CF ₃
0	H	H	H	H	O	3-F	4-F	2-Cl-4-SCF ₂ CHF ₂
0	H	H	H	H	O	3-F	4-F	3-Cl-4-CF ₃
0	H	H	H	H	O	3-F	4-F	3-F-4-OCF ₃
0	H	H	H	H	O	3-F	4-F	3-Cl-4-OCF ₃
0	H	H	H	H	O	3-F	4-F	3-Cl-4-OCHF ₂
0	H	H	H	H	O	3-F	4-F	3-Cl-4-OCF ₂ CHF ₂
0	H	H	H	H	O	3-F	4-F	3-Cl-4-OCF ₂ CHFOCF ₃
0	H	H	H	H	O	3-F	4-F	3-Cl-4-SCHF ₂
0	H	H	H	H	O	3-F	4-F	3-Cl-4-CO ₂ CH ₃
0	H	H	H	H	O	3-F	4-F	3-Cl-4-CO ₂ CH(CH ₂ F) ₂
0	H	H	H	H	O	3-F	4-F	3-Cl-4-O(C ₆ H ₄ -4-CF ₃)
0	H	H	H	H	O	3-F	4-F	3-Cl-4-O(Q5-5-CF ₃)
0	H	H	H	H	O	3-F	4-F	3-Cl-4-NH(Q5-5-CF ₃)
0	H	H	H	H	O	3-F	4-F	3-Br-4-OCF ₃
0	H	H	H	H	O	3-F	4-F	3-CH ₃ -4-OCF ₂ CHF ₂
0	H	H	H	H	O	3-F	4-F	3-CF ₃ -4-Cl
0	H	H	H	H	O	3-F	4-F	3-CF ₃ -4-OCF ₂ CHF ₂
0	H	H	H	H	O	3-F	4-F	3-CF ₃ -4-OCF ₂ CHFBx
0	H	H	H	H	O	3-F	4-F	3,4-(CF ₃) ₂
0	H	H	H	H	O	3-F	4-F	3,4-(OCF ₃) ₂
0	H	H	H	H	O	3-F	4-F	2,3-F ₂ -4-OCF ₃
0	H	H	H	H	O	3-F	4-F	2,5-F ₂ -4-Cl
0	H	H	H	H	O	3-F	4-F	2,5-F ₂ -4-Br
0	H	H	H	H	O	3-F	4-F	2,5-F ₂ -4-OCF ₃
0	H	H	H	H	O	3-F	4-F	3,5-F ₂ -4-CF ₃
0	H	H	H	H	O	3-F	4-F	2,5-Cl ₂ -4-OCF ₂ CHF ₂
0	H	H	H	H	O	3-F	4-F	2,5-Cl ₂ -4-O(Q5-3,5-Cl ₂)
0	H	H	H	H	O	3-F	4-F	2,6-Cl ₂ -4-CF ₃
0	H	H	H	H	O	3-F	4-F	2,3,4-F ₃
0	H	H	H	H	O	3-F	4-F	2,4,5-F ₃
0	H	H	H	H	O	3-F	4-F	2,3,4-Cl ₃
0	H	H	H	H	O	3-F	4-F	2,4,5-Cl ₃
0	H	H	H	H	O	3-F	4-F	2,4,6-Cl ₃
0	H	H	H	H	O	3-F	4-F	3,4,5-Cl ₃
0	H	H	H	H	O	3-F	4-F	2-F-4,5-Cl ₂
0	H	H	H	H	O	3-F	4-F	3,5-Cl ₂ -4-O(Q5-5-CF ₃)
0	H	H	H	H	O	3-F	4-F	3,5-Cl ₂ -4-O(C ₆ H ₄ -4-CF ₃)

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k	R ¹	R ²	R ³	R ⁴	W	X ₁	Y _m	Z _n
0	H	H	H	H	O	3-F	4-F	3,5-Cl ₂ -4-OCH ₂ CH=CH ₂
0	H	H	H	H	O	3-F	4-F	3,5-Cl ₂ -4-OCF ₂ CHF ₂
0	H	H	H	H	O	3-F	4-F	3,5-Cl ₂ -4-OCF ₂ CHFOCF ₃
0	H	H	H	H	O	3-F	4-F	3,5-Cl ₂ -4-SCF ₂ CHF ₂
0	H	H	H	H	O	3-F	4-F	3,5-Cl ₂ -4-N(CH ₃)CH ₂ CH ₂ CH ₃
0	H	H	H	H	O	3-F	4-F	3,5-Cl ₂ -4-N(CH ₃)CH ₂ C ₆ H ₅
0	H	H	H	H	O	3-F	4-F	2-F-3-CF ₃ -5-Cl
0	H	H	H	H	O	3-F	4-F	2-F-4-OCF ₃ -5-Cl
0	H	H	H	H	O	3-F	4-F	2-F-4-OCF ₂ CHF ₂ -5-Cl
0	H	H	H	H	O	3-F	4-F	2-CF ₃ -4,6-(NO ₂) ₂
0	H	H	H	H	O	3-F	4-F	2,3,4,5-F ₄
0	H	H	H	H	O	3-F	4-F	2,3,5,6-F ₄
0	H	H	H	H	O	3-F	4-F	2,3,4,5-Cl ₄
0	H	H	H	H	O	3-F	4-F	2,4-F ₂ -3,5-Cl ₂
0	H	H	H	H	O	3-F	4-F	2,6-F ₂ -3,5-Cl ₂
0	H	H	H	H	O	3-F	4-F	2,3,5-F ₃ -4-OCF ₃
0	H	H	H	H	O	3-F	4-F	2-F-3,5-Cl ₂ -4-OCF ₂ CHF ₂
0	H	H	H	H	O	3-F	4-F	2,3,4,5,6-F ₅
0	H	H	H	H	O	3-F	4-F	2,3,5,6-F ₄ -4-CN
0	H	H	H	H	O	3-F	4-F	2,4,6-F ₃ -3,5-Cl ₂
0	H	H	H	H	O	3-F	4-F	3-Cl-4-F
0	H	H	H	H	O	3-F	4-F	4-OSO ₂ CF ₃
0	H	H	H	H	O	3-F	4-F	4-(Q1-2,2-Cl ₂)
0	H	H	H	H	O	3-F	4-F	4-SO ₂ CF ₂ CF ₂ CF ₃
0	H	H	H	H	O	3-F	4-F	4-SOCF ₂ CHF ₂
0	H	H	H	H	O	3-F	4-F	4-SO ₂ CHF ₂
0	H	H	H	H	O	3-F	4-F	3-OCF ₂ O-4
0	H	H	H	H	O	3-F	4-F	3-OCH ₂ O-4
0	H	H	H	H	O	3-F	4-F	3-OCF ₂ CF ₂ O-4
0	H	H	H	H	O	3-CF ₃	4-F	4-F
0	H	H	H	H	O	3-CF ₃	4-F	3-Cl
0	H	H	H	H	O	3-CF ₃	4-F	4-Cl
0	H	H	H	H	O	3-CF ₃	4-F	4-Br
0	H	H	H	H	O	3-CF ₃	4-F	4-I
0	H	H	H	H	O	3-CF ₃	4-F	4-CH ₃
0	H	H	H	H	O	3-CF ₃	4-F	4-C(CH ₃) ₃
0	H	H	H	H	O	3-CF ₃	4-F	4-CHF ₂
0	H	H	H	H	O	3-CF ₃	4-F	3-CF ₃
0	H	H	H	H	O	3-CF ₃	4-F	4-CF ₃
0	H	H	H	H	O	3-CF ₃	4-F	4-OCH ₃
0	H	H	H	H	O	3-CF ₃	4-F	4-OCH ₂ CH ₃
0	H	H	H	H	O	3-CF ₃	4-F	4-OCHF ₂

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k	R ¹	R ²	R ³	R ⁴	W	X ₁	Y _m	Z _n
0	H	H	H	H	O	3-CF ₃	4-F	4-OCF ₂ Br
0	H	H	H	H	O	3-CF ₃	4-F	3-OCF ₃
0	H	H	H	H	O	3-CF ₃	4-F	4-OCF ₃
0	H	H	H	H	O	3-CF ₃	4-F	4-OCH ₂ CF ₃
0	H	H	H	H	O	3-CF ₃	4-F	4-OCF ₂ CF ₃
0	H	H	H	H	O	3-CF ₃	4-F	4-OCF ₂ CHF ₂
0	H	H	H	H	O	3-CF ₃	4-F	4-OCF ₂ CHFC1
0	H	H	H	H	O	3-CF ₃	4-F	4-OCF ₂ CF ₂ CF ₃
0	H	H	H	H	O	3-CF ₃	4-F	4-SCH ₃
0	H	H	H	H	O	3-CF ₃	4-F	4-SCHF ₂
0	H	H	H	H	O	3-CF ₃	4-F	4-SCF ₂ Br
0	H	H	H	H	O	3-CF ₃	4-F	4-SCF ₃
0	H	H	H	H	O	3-CF ₃	4-F	4-SOCH ₃
0	H	H	H	H	O	3-CF ₃	4-F	4-SOCF ₃
0	H	H	H	H	O	3-CF ₃	4-F	4-SO ₂ CH ₃
0	H	H	H	H	O	3-CF ₃	4-F	4-SO ₂ CF ₃
0	H	H	H	H	O	3-CF ₃	4-F	4-SO ₂ CF ₂ CHF ₂
0	H	H	H	H	O	3-CF ₃	4-F	4-OCO ₂ CH ₃
0	H	H	H	H	O	3-CF ₃	4-F	4-OCF ₂ CHFOCF ₃
0	H	H	H	H	O	3-CF ₃	4-F	4-OCOCH ₃
0	H	H	H	H	O	3-CF ₃	4-F	4-COCH ₃
0	H	H	H	H	O	3-CF ₃	4-F	4-COCF ₃
0	H	H	H	H	O	3-CF ₃	4-F	4-CO ₂ CH ₂ CH ₃
0	H	H	H	H	O	3-CF ₃	4-F	4-CO ₂ CH ₂ CF ₃
0	H	H	H	H	O	3-CF ₃	4-F	4-NO ₂
0	H	H	H	H	O	3-CF ₃	4-F	4-CN
0	H	H	H	H	O	3-CF ₃	4-F	4-OH
0	H	H	H	H	O	3-CF ₃	4-F	4-CO ₂ H
0	H	H	H	H	O	3-CF ₃	4-F	4-OSO ₂ CH ₃
0	H	H	H	H	O	3-CF ₃	4-F	4-OSO ₂ CF ₃
0	H	H	H	H	O	3-CF ₃	4-F	4-N(CH ₃) ₂
0	H	H	H	H	O	3-CF ₃	4-F	4-Si(CH ₃) ₃
0	H	H	H	H	O	3-CF ₃	4-F	4-C ₆ H ₅
0	H	H	H	H	O	3-CF ₃	4-F	4-OC ₆ H ₅
0	H	H	H	H	O	3-CF ₃	4-F	4-O(C ₆ H ₄ -4-CF ₃)
0	H	H	H	H	O	3-CF ₃	4-F	4-O(Q5-5-CF ₃)
0	H	H	H	H	O	3-CF ₃	4-F	4-SO ₂ C ₆ H ₅
0	H	H	H	H	O	3-CF ₃	4-F	4-CH ₂ C ₆ H ₅
0	H	H	H	H	O	3-CF ₃	4-F	4-COC ₆ H ₅
0	H	H	H	H	O	3-CF ₃	4-F	2,4-F ₂
0	H	H	H	H	O	3-CF ₃	4-F	3,4-Cl ₂
0	H	H	H	H	O	3-CF ₃	4-F	3,4-Br ₂

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k	R ¹	R ²	R ³	R ⁴	W	X ₁	Y _m	Z _n
0	H	H	H	H	O	3-CF ₃	4-F	2-F-4-Cl
0	H	H	H	H	O	3-CF ₃	4-F	2-F-4-OCF ₃
0	H	H	H	H	O	3-CF ₃	4-F	2-F-4-OCF ₂ CHF ₂
0	H	H	H	H	O	3-CF ₃	4-F	3-Cl-4-CF ₃
0	H	H	H	H	O	3-CF ₃	4-F	3-F-4-OCF ₃
0	H	H	H	H	O	3-CF ₃	4-F	2-F-4-OCF ₂ CHF ₂
0	H	H	H	H	O	3-CF ₃	4-F	3-Cl-4-OCF ₂ CHFOCF ₃
0	H	H	H	H	O	3-CF ₃	4-F	3-Cl-4-SCHF ₂
0	H	H	H	H	O	3-CF ₃	4-F	2,5-F ₂ -4-OCF ₃
0	H	H	H	H	O	3-CF ₃	4-F	2-F-4,5-Cl ₂
0	H	H	H	H	O	3-CF ₃	4-F	3,5-Cl ₂ -4-OCF ₂ CHF ₂
0	H	H	H	H	O	3-CF ₃	4-F	3,4,5-Cl ₃
0	H	H	H	H	O	3-CF ₃	4-F	2-F-4-OCF ₂ CHF ₂ -5-Cl
0	H	H	H	H	O	3-CF ₃	4-F	2,4-F ₂ -3,5-Cl ₂
0	H	H	H	H	O	3-Cl	4-F	4-Cl
0	H	H	H	H	O	3-Cl	4-F	4-Br
0	H	H	H	H	O	3-Cl	4-F	4-CF ₃
0	H	H	H	H	O	3-Cl	4-F	4-OCH ₂ CH ₃
0	H	H	H	H	O	3-Cl	4-F	4-OCHF ₂
0	H	H	H	H	O	3-Cl	4-F	4-OCF ₂ Br
0	H	H	H	H	O	3-Cl	4-F	4-OCF ₂ CHF ₂
0	H	H	H	H	O	3-Cl	4-F	4-OCF ₃
0	H	H	H	H	O	3-Cl	4-F	4-SCHF ₂
0	H	H	H	H	O	3-Cl	4-F	4-SCF ₂ Br
0	H	H	H	H	O	3-Cl	4-F	4-SCF ₃
0	H	H	H	H	O	3-Cl	4-F	4-O(Q6-6-Cl)
0	H	H	H	H	O	3-Cl	4-F	4-O(Q7)
0	H	H	H	H	O	3-Cl	4-F	4-O(Q5-5-CF ₃)
0	H	H	H	H	O	3-Cl	4-F	4-OCF ₂ CHFOCF ₃
0	H	H	H	H	O	3-Cl	4-F	4-COCF ₃
0	H	H	H	H	O	3-Cl	4-F	4-CO ₂ CH ₂ CH ₃
0	H	H	H	H	O	3-Cl	4-F	4-NO ₂
0	H	H	H	H	O	3-Cl	4-F	4-CN
0	H	H	H	H	O	3-Cl	4-F	4-OSO ₂ CF ₃
0	H	H	H	H	O	3-Cl	4-F	3,4-Cl ₂
0	H	H	H	H	O	3-Cl	4-F	3-Cl-4-OCF ₂ CHF ₂
0	H	H	H	H	O	3-Cl	4-F	2,4-F ₂ -3,5-Cl ₂
0	H	H	H	H	O	H	H	4-Cl
0	H	H	H	H	O	H	H	4-Br
0	H	H	H	H	O	H	H	4-CF ₃
0	H	H	H	H	O	H	H	4-OCHF ₂
0	H	H	H	H	O	H	H	4-OCF ₂ Br

k	R ¹	R ²	R ³	R ⁴	W	X ₁	Y _m	Z _n
0	H	H	H	O		H	H	4-OCF ₂ CHF ₂
0	H	H	H	O		H	H	4-OCF ₃
0	H	H	H	O		H	H	4-SCF ₃
0	H	H	H	O		H	H	4-OSO ₂ CF ₃
0	H	H	H	O		H	H	3,4-Cl ₂
0	H	H	H	O		H	4-F	4-Cl
0	H	H	H	O		H	4-F	4-Br
0	H	H	H	O		H	4-F	4-CF ₃
0	H	H	H	O		H	4-F	4-OCHF ₂
0	H	H	H	O		H	4-F	4-OCF ₂ Br
0	H	H	H	O		H	4-F	4-OCF ₂ CHF ₂
0	H	H	H	O		H	4-F	4-OCF ₃
0	H	H	H	O		H	4-F	4-SCF ₃
0	H	H	H	O		H	4-F	4-OSO ₂ CF ₃
0	H	H	H	O		H	4-F	3,4-Cl ₂
0	H	H	H	O		H	4-CN	4-Cl
0	H	H	H	O		H	4-CN	4-Br
0	H	H	H	O		H	4-CN	4-CF ₃
0	H	H	H	O		H	4-CN	4-OCHF ₂
0	H	H	H	O		H	4-CN	4-OCF ₂ Br
0	H	H	H	O		H	4-CN	4-OCF ₂ CHF ₂
0	H	H	H	O		H	4-CN	4-OCF ₃
0	H	H	H	O		H	4-CN	4-SCF ₃
0	H	H	H	O		H	4-CN	4-OSO ₂ CF ₃
0	H	H	H	O		H	4-CN	3,4-Cl ₂
0	H	H	H	O		H	4-Cl	4-Cl
0	H	H	H	O		H	4-Cl	4-Br
0	H	H	H	O		H	4-Cl	4-CF ₃
0	H	H	H	O		H	4-Cl	4-OCHF ₂
0	H	H	H	O		H	4-Cl	4-OCF ₂ Br
0	H	H	H	O		H	4-Cl	4-OCF ₂ CHF ₂
0	H	H	H	O		H	4-Cl	4-OCF ₃
0	H	H	H	O		H	4-Cl	4-SCF ₃
0	H	H	H	O		H	4-Cl	4-OSO ₂ CF ₃
0	H	H	H	O		H	4-Cl	3,4-Cl ₂
0	H	H	H	O		H	4-CF ₃	4-Cl
0	H	H	H	O		H	4-CF ₃	4-Br
0	H	H	H	O		H	4-CF ₃	4-CF ₃
0	H	H	H	O		H	4-CF ₃	4-OCHF ₂
0	H	H	H	O		H	4-CF ₃	4-OCF ₂ Br
0	H	H	H	O		H	4-CF ₃	4-OCF ₂ CHF ₂
0	H	H	H	O		H	4-CF ₃	4-OCF ₃

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k	R ¹	R ²	R ³	R ⁴	W	X ₁	Y _m	Z _n
0	H	H	H	H	O	H	4-CF ₃	4-SCF ₃
0	H	H	H	H	O	H	4-CF ₃	4-OSO ₂ CF ₃
0	H	H	H	H	O	H	4-CF ₃	3,4-Cl ₂
0	H	H	H	H	O	H	4-OSO ₂ CF ₃	4-Cl
0	H	H	H	H	O	H	4-OSO ₂ CF ₃	4-Br
0	H	H	H	H	O	H	4-OSO ₂ CF ₃	4-CF ₃
0	H	H	H	H	O	H	4-OSO ₂ CF ₃	4-OCHF ₂
0	H	H	H	H	O	H	4-OSO ₂ CF ₃	4-OCF ₂ Br
0	H	H	H	H	O	3-F	4-OSO ₂ CF ₃	4-OCF ₂ CHF ₂
0	H	H	H	H	O	3-F	4-OSO ₂ CF ₃	4-OCF ₃
0	H	H	H	H	O	3-F	4-OSO ₂ CF ₃	4-SCF ₃
0	H	H	H	H	O	3-F	4-OSO ₂ CF ₃	4-OSO ₂ CF ₃
0	H	H	H	H	O	3-F	4-OSO ₂ CF ₃	3,4-Cl ₂
0	H	H	H	H	O	3-F	4-Cl	4-Cl
0	H	H	H	H	O	3-F	4-Cl	4-Br
0	H	H	H	H	O	3-F	4-Cl	4-CF ₃
0	H	H	H	H	O	3-F	4-Cl	4-OCHF ₂
0	H	H	H	H	O	3-F	4-Cl	4-OCF ₂ Br
0	H	H	H	H	O	3-F	4-Cl	4-OCF ₂ CHF ₂
0	H	H	H	H	O	3-F	4-Cl	4-OCF ₃
0	H	H	H	H	O	3-F	4-Cl	4-SCF ₃
0	H	H	H	H	O	3-F	4-Cl	4-OSO ₂ CF ₃
0	H	H	H	H	O	3-F	4-Cl	3,4-Cl ₂
0	H	H	H	H	O	3-F	4-OCF ₃	4-Cl
0	H	H	H	H	O	3-F	4-OCF ₃	4-Br
0	H	H	H	H	O	3-F	4-OCF ₃	4-CF ₃
0	H	H	H	H	O	3-F	4-OCF ₃	4-OCHF ₂
0	H	H	H	H	O	3-F	4-OCF ₃	4-OCF ₂ Br
0	H	H	H	H	O	3-F	4-OCF ₃	4-OCF ₂ CHF ₂
0	H	H	H	H	O	3-F	4-OCF ₃	4-OCF ₃
0	H	H	H	H	O	3-F	4-OCF ₃	4-SCF ₃
0	H	H	H	H	O	3-F	4-OCF ₃	4-OSO ₂ CF ₃
0	H	H	H	H	O	3-F	4-OCF ₃	3,4-Cl ₂
0	H	H	H	H	O	3-F	4-OCHF ₂	4-Cl
0	H	H	H	H	O	3-F	4-OCHF ₂	4-Br
0	H	H	H	H	O	3-F	4-OCHF ₂	4-CF ₃
0	H	H	H	H	O	3-F	4-OCHF ₂	4-OCHF ₂
0	H	H	H	H	O	3-F	4-OCHF ₂	4-OCF ₂ Br
0	H	H	H	H	O	3-F	4-OCHF ₂	4-OCF ₂ CHF ₂
0	H	H	H	H	O	3-F	4-OCHF ₂	4-OCF ₃
0	H	H	H	H	O	3-F	4-OCHF ₂	4-SCF ₃
0	H	H	H	H	O	3-F	4-OCHF ₂	4-OSO ₂ CF ₃

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k	R ¹	R ²	R ³	R ⁴	W	X ₁	Y _n	Z _n
0	H	H	H	H	O	3-F	4-OCHF ₂	3,4-Cl ₂
0	H	H	H	H	O	3-F	4-Br	4-Cl
0	H	H	H	H	O	3-F	4-Br	4-Br
0	H	H	H	H	O	3-F	4-Br	4-CF ₃
0	H	H	H	H	O	3-F	4-Br	4-OCHF ₂
0	H	H	H	H	O	3-F	4-Br	4-OCF ₂ Br
0	H	H	H	H	O	3-F	4-Br	4-OCF ₂ CHF ₂
0	H	H	H	H	O	3-F	4-Br	4-OCF ₃
0	H	H	H	H	O	3-F	4-Br	4-SCF ₃
0	H	H	H	H	O	3-F	4-Br	4-OSO ₂ CF ₃
0	H	H	H	H	O	3-F	4-Br	3,4-Cl ₂
0	H	H	H	H	O	3-Br	4-F	4-Cl
0	H	H	H	H	O	3-Br	4-F	4-Br
0	H	H	H	H	O	3-Br	4-F	4-CF ₃
0	H	H	H	H	O	3-Br	4-F	4-OCHF ₂
0	H	H	H	H	O	3-Br	4-F	4-OCF ₂ Br
0	H	H	H	H	O	3-Br	4-F	4-OCF ₂ CHF ₂
0	H	H	H	H	O	3-Br	4-F	4-OCF ₃
0	H	H	H	H	O	3-Br	4-F	4-SCF ₃
0	H	H	H	H	O	3-Br	4-F	4-OSO ₂ CF ₃
0	H	H	H	H	O	3-Br	4-F	3,4-Cl ₂
0	H	H	H	H	O	3-OCHF ₂	4-F	4-Cl
0	H	H	H	H	O	3-OCHF ₂	4-F	4-Br
0	H	H	H	H	O	3-OCHF ₂	4-F	4-CF ₃
0	H	H	H	H	O	3-OCHF ₂	4-F	4-OCHF ₂
0	H	H	H	H	O	3-OCHF ₂	4-F	4-OCF ₂ Br
0	H	H	H	H	O	3-OCHF ₂	4-F	4-OCF ₂ CHF ₂
0	H	H	H	H	O	3-OCHF ₂	4-F	4-OCF ₃
0	H	H	H	H	O	3-OCHF ₂	4-F	4-SCF ₃
0	H	H	H	H	O	3-OCHF ₂	4-F	4-OSO ₂ CF ₃
0	H	H	H	H	O	3-OCHF ₂	4-F	3,4-Cl ₂
0	H	H	H	H	O	3-OSO ₂ CF ₃	4-F	4-Cl
0	H	H	H	H	O	3-OSO ₂ CF ₃	4-F	4-Br
0	H	H	H	H	O	3-OSO ₂ CF ₃	4-F	4-CF ₃
0	H	H	H	H	O	3-OSO ₂ CF ₃	4-F	4-OCHF ₂
0	H	H	H	H	O	3-OSO ₂ CF ₃	4-F	4-OCF ₂ Br
0	H	H	H	H	O	3-OSO ₂ CF ₃	4-F	4-OCF ₂ CHF ₂
0	H	H	H	H	O	3-OSO ₂ CF ₃	4-F	4-OCF ₃
0	H	H	H	H	O	3-OSO ₂ CF ₃	4-F	4-SCF ₃
0	H	H	H	H	O	3-OSO ₂ CF ₃	4-F	4-OSO ₂ CF ₃
0	H	H	H	H	O	3-OSO ₂ CF ₃	4-F	3,4-Cl ₂
0	H	H	H	H	O	3-OCF ₃	4-F	4-Cl

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k	R ¹	R ²	R ³	R ⁴	W	X ₁	Y _m	Z _n
0	H	H	H	H	O	3-OCF ₃	4-F	4-Br
0	H	H	H	H	O	3-OCF ₃	4-F	4-CF ₃
0	H	H	H	H	O	3-OCF ₃	4-F	4-OCHF ₂
0	H	H	H	H	O	3-OCF ₃	4-F	4-OCF ₂ Br
0	H	H	H	H	O	3-OCF ₃	4-F	4-OCF ₂ CHF ₂
0	H	H	H	H	O	3-OCF ₃	4-F	4-OCF ₃
0	H	H	H	H	O	3-OCF ₃	4-F	4-SCF ₃
0	H	H	H	H	O	3-OCF ₃	4-F	4-OSO ₂ CF ₃
0	H	H	H	H	O	3-OCF ₃	4-F	3,4-Cl ₂
0	H	H	H	H	O	3-Cl	4-CN	4-Cl
0	H	H	H	H	O	3-Cl	4-CN	4-Br
0	H	H	H	H	O	3-Cl	4-CN	4-CF ₃
0	H	H	H	H	O	3-Cl	4-CN	4-OCHF ₂
0	H	H	H	H	O	3-Cl	4-CN	4-OCF ₂ Br
0	H	H	H	H	O	3-Cl	4-CN	4-OCF ₂ CHF ₂
0	H	H	H	H	O	3-Cl	4-CN	4-OCF ₃
0	H	H	H	H	O	3-Cl	4-CN	4-SCF ₃
0	H	H	H	H	O	3-Cl	4-CN	4-OSO ₂ CF ₃
0	H	H	H	H	O	3-Cl	4-CN	3,4-Cl ₂
0	H	H	H	H	O	3-CF ₃	4-CN	4-Cl
0	H	H	H	H	O	3-CF ₃	4-CN	4-Br
0	H	H	H	H	O	3-CF ₃	4-CN	4-CF ₃
0	H	H	H	H	O	3-CF ₃	4-CN	4-OCHF ₂
0	H	H	H	H	O	3-CF ₃	4-CN	4-OCF ₂ Br
0	H	H	H	H	O	3-CF ₃	4-CN	4-OCF ₂ CHF ₂
0	H	H	H	H	O	3-CF ₃	4-CN	4-OCF ₃
0	H	H	H	H	O	3-CF ₃	4-CN	4-SCF ₃
0	H	H	H	H	O	3-CF ₃	4-CN	4-OSO ₂ CF ₃
0	H	H	H	H	O	3-CF ₃	4-CN	3,4-Cl ₂
0	H	H	H	H	O	3-OCF ₂ CHF ₂	4-F	4-Cl
0	H	H	H	H	O	3-OCF ₂ CHF ₂	4-F	4-Br
0	H	H	H	H	O	3-OCF ₂ CHF ₂	4-F	4-CF ₃
0	H	H	H	H	O	3-OCF ₂ CHF ₂	4-F	4-OCHF ₂
0	H	H	H	H	O	3-OCF ₂ CHF ₂	4-F	4-OCF ₂ Br
0	H	H	H	H	O	3-OCF ₂ CHF ₂	4-F	4-OCF ₂ CHF ₂
0	H	H	H	H	O	3-OCF ₂ CHF ₂	4-F	4-OCF ₃
0	H	H	H	H	O	3-OCF ₂ CHF ₂	4-F	4-SCF ₃
0	H	H	H	H	O	3-OCF ₂ CHF ₂	4-F	4-OSO ₂ CF ₃
0	H	H	H	H	O	3-OCF ₂ CHF ₂	4-F	3,4-Cl ₂
0	H	H	H	H	O	4-F	4-F	4-Cl
0	H	H	H	H	O	4-F	4-F	4-Br
0	H	H	H	H	O	4-F	4-F	4-CF ₃

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k	R ¹	R ²	R ³	R ⁴	W	X ₁	Y _m	Z _n
0	H	H	H	H	O	4-F	4-F	4-OCHF ₂
0	H	H	H	H	O	4-F	4-F	4-OCF ₂ Br
0	H	H	H	H	O	4-F	4-F	4-OCF ₂ CHF ₂
0	H	H	H	H	O	4-F	4-F	4-OCF ₃
0	H	H	H	H	O	4-F	4-F	4-SCF ₃
0	H	H	H	H	O	4-F	4-F	4-OSO ₂ CF ₃
0	H	H	H	H	O	4-F	4-F	3,4-Cl ₂
0	H	H	H	H	O	3-CN	4-F	4-Cl
0	H	H	H	H	O	3-CN	4-F	4-Br
0	H	H	H	H	O	3-CN	4-F	4-CF ₃
0	H	H	H	H	O	3-CN	4-F	4-OCHF ₂
0	H	H	H	H	O	3-CN	4-F	4-OCF ₂ Br
0	H	H	H	H	O	3-CN	4-F	4-OCF ₂ CHF ₂
0	H	H	H	H	O	3-CN	4-F	4-OCF ₃
0	H	H	H	H	O	3-CN	4-F	4-SCF ₃
0	H	H	H	H	O	3-CN	4-F	4-OSO ₂ CF ₃
0	H	H	H	H	O	3-CN	4-F	3,4-Cl ₂
0	H	H	H	H	O	4-OCHF ₂	4-F	4-Cl
0	H	H	H	H	O	4-OCHF ₂	4-F	4-Br
0	H	H	H	H	O	4-OCHF ₂	4-F	4-CF ₃
0	H	H	H	H	O	4-OCHF ₂	4-F	4-OCHF ₂
0	H	H	H	H	O	4-OCHF ₂	4-F	4-OCF ₂ Br
0	H	H	H	H	O	4-OCHF ₂	4-F	4-OCF ₂ CHF ₂
0	H	H	H	H	O	4-OCHF ₂	4-F	4-OCF ₃
0	H	H	H	H	O	4-OCHF ₂	4-F	4-SCF ₃
0	H	H	H	H	O	4-OCHF ₂	4-F	4-OSO ₂ CF ₃
0	H	H	H	H	O	4-OCHF ₂	4-F	3,4-Cl ₂
0	H	H	H	H	O	4-OCHF ₂	4-F	4-Cl
0	H	H	H	H	O	3-F	2,4-F ₂	4-Br
0	H	H	H	H	O	3-F	2,4-F ₂	4-CF ₃
0	H	H	H	H	O	3-F	2,4-F ₂	4-OCHF ₂
0	H	H	H	H	O	3-F	2,4-F ₂	4-OCF ₂ Br
0	H	H	H	H	O	3-F	2,4-F ₂	4-OCF ₂ CHF ₂
0	H	H	H	H	O	3-F	2,4-F ₂	4-OCF ₃
0	H	H	H	H	O	3-F	2,4-F ₂	4-SCF ₃
0	H	H	H	H	O	3-F	2,4-F ₂	4-OSO ₂ CF ₃
0	H	H	H	H	O	3-F	2,4-F ₂	3,4-Cl ₂
0	H	H	H	H	O	3-F	3,4-F ₂	4-Cl
0	H	H	H	H	O	3-F	3,4-F ₂	4-Br
0	H	H	H	H	O	3-F	3,4-F ₂	4-CF ₃
0	H	H	H	H	O	3-F	3,4-F ₂	4-OCHF ₂
0	H	H	H	H	O	3-F	3,4-F ₂	4-OCF ₂ Br

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k	R ¹	R ²	R ³	R ⁴	W	X ₁	Y _m	Z _n
0	H	H	H	H	O	3-F	3,4-F ₂	4-OCF ₂ CHF ₂
0	H	H	H	H	O	3-F	3,4-F ₂	4-OCF ₃
0	H	H	H	H	O	3-F	3,4-F ₂	4-SCF ₃
0	H	H	H	H	O	3-F	3,4-F ₂	4-OSO ₂ CF ₃
0	H	H	H	H	O	3-F	3,4-F ₂	3,4-Cl ₂
0	H	H	H	H	O	3,4-F ₂	4-F	4-Cl
0	H	H	H	H	O	3,4-F ₂	4-F	4-Br
0	H	H	H	H	O	3,4-F ₂	4-F	4-CF ₃
0	H	H	H	H	O	3,4-F ₂	4-F	4-OCHF ₂
0	H	H	H	H	O	3,4-F ₂	4-F	4-OCF ₂ Br
0	H	H	H	H	O	3,4-F ₂	4-F	4-OCF ₂ CHF ₂
0	H	H	H	H	O	3,4-F ₂	4-F	4-OCF ₃
0	H	H	H	H	O	3,4-F ₂	4-F	4-SCF ₃
0	H	H	H	H	O	3,4-F ₂	4-F	4-OSO ₂ CF ₃
0	H	H	H	H	O	3,4-F ₂	4-F	3,4-Cl ₂
0	H	H	H	H	O	3-CF ₃	H	4-Cl
0	H	H	H	H	O	3-CF ₃	2-F	4-CF ₃
0	H	H	H	H	O	3-CF ₃	3-F	4-OCF ₃
0	H	H	H	H	O	3-CF ₃	2-Cl	4-Cl
0	H	H	H	H	O	3-CF ₃	3-Cl	4-CF ₃
0	H	H	H	H	O	3-CF ₃	4-Cl	4-OCF ₃
0	H	H	H	H	O	3-CF ₃	3-Br	4-Cl
0	H	H	H	H	O	3-CF ₃	4-Br	4-CF ₃
0	H	H	H	H	O	3-CF ₃	3-I	4-OCF ₃
0	H	H	H	H	O	3-CF ₃	4-I	4-Cl
0	H	H	H	H	O	3-CF ₃	4-CH ₃	4-CF ₃
0	H	H	H	H	O	3-CF ₃	4-CH ₂ CH ₃	4-OCF ₃
0	H	H	H	H	O	3-CF ₃	4-CH(CH ₃) ₂	4-Cl
0	H	H	H	H	O	3-CF ₃	4-CH ₂ CH ₂ CH ₂ CH ₃	4-CF ₃
0	H	H	H	H	O	3-CF ₃	4-C(CH ₃) ₃	4-OCF ₃
0	H	H	H	H	O	3-CF ₃	4-CH ₂ CH=CH ₂	4-Cl
0	H	H	H	H	O	3-CF ₃	4-Q1	4-CF ₃
0	H	H	H	H	O	3-CF ₃	4-Q2	4-OCF ₃
0	H	H	H	H	O	3-CF ₃	4-Q3	4-Cl
0	H	H	H	H	O	3-CF ₃	4-Q4	4-CF ₃
0	H	H	H	H	O	3-CF ₃	4-CHF ₂	4-OCF ₃
0	H	H	H	H	O	3-CF ₃	4-CH ₂ Br	4-Cl
0	H	H	H	H	O	3-CF ₃	4-CH ₂ Cl	4-CF ₃
0	H	H	H	H	O	3-CF ₃	2-CF ₃	4-Cl
0	H	H	H	H	O	3-CF ₃	3-CF ₃	4-CF ₃
0	H	H	H	H	O	3-CF ₃	4-CF ₃	4-OCF ₃
0	H	H	H	H	O	3-CF ₃	4-CH=C(Cl)CF ₃	4-Cl

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k	R ¹	R ²	R ³	R ⁴	W	X ₁	Y _m	Z _n
0	H	H	H	H	O	3-CF ₃	4-(Q4-1-Cl)	4-CF ₃
0	H	H	H	H	O	3-CF ₃	4-CH ₂ CN	4-OCF ₃
0	H	H	H	H	O	3-CF ₃	4-CH ₂ OH	4-Cl
0	H	H	H	H	O	3-CF ₃	4-CH ₂ CO ₂ H	4-CF ₃
0	H	H	H	H	O	3-CF ₃	4-OCH ₃	4-OCF ₃
0	H	H	H	H	O	3-CF ₃	4-OCH ₂ CH ₃	4-Cl
0	H	H	H	H	O	3-CF ₃	4-OCH(CH ₃) ₂	4-CF ₃
0	H	H	H	H	O	3-CF ₃	4-OCH ₂ CH ₂ CH ₂ CH ₃	4-OCF ₃
0	H	H	H	H	O	3-CF ₃	4-OC(CH ₃) ₃	4-Cl
0	H	H	H	H	O	3-CF ₃	4-O(Q4)	4-CF ₃
0	H	H	H	H	O	3-CF ₃	4-OCHF ₂	4-OCF ₃
0	H	H	H	H	O	3-CF ₃	4-OCF ₂ Br	4-Cl
0	H	H	H	H	O	3-CF ₃	2-OCF ₃	4-CF ₃
0	H	H	H	H	O	3-CF ₃	3-OCF ₃	4-OCF ₃
0	H	H	H	H	O	3-CF ₃	4-OCF ₃	4-Cl
0	H	H	H	H	O	3-CF ₃	4-OCH ₂ CF ₃	4-CF ₃
0	H	H	H	H	O	3-CF ₃	4-OCF ₂ CF ₃	4-OCF ₃
0	H	H	H	H	O	3-CF ₃	4-OCF ₂ CHF ₂	4-Cl
0	H	H	H	H	O	3-CF ₃	4-OCF ₂ CHFC1	4-CF ₃
0	H	H	H	H	O	3-CF ₃	4-OCF ₂ CHFBr	4-Cl
0	H	H	H	H	O	3-CF ₃	4-OCF ₂ CF ₂ CF ₃	4-CF ₃
0	H	H	H	H	O	3-CF ₃	4-OCH ₂ CH=CHCl	4-OCF ₃
0	H	H	H	H	O	3-CF ₃	4-O(Q4-2,2-Cl ₂)	4-Cl
0	H	H	H	H	O	3-CF ₃	4-SCH ₃	4-CF ₃
0	H	H	H	H	O	3-CF ₃	4-SCHF ₂	4-OCF ₃
0	H	H	H	H	O	3-CF ₃	4-SCF ₂ Br	4-Cl
0	H	H	H	H	O	3-CF ₃	4-SCF ₃	4-CF ₃
0	H	H	H	H	O	3-CF ₃	4-SCF ₂ CHF ₂	4-OCF ₃
0	H	H	H	H	O	3-CF ₃	4-SOCH ₃	4-Cl
0	H	H	H	H	O	3-CF ₃	4-SOCF ₃	4-CF ₃
0	H	H	H	H	O	3-CF ₃	4-SOCF ₂ CHF ₂	4-OCF ₃
0	H	H	H	H	O	3-CF ₃	4-SO ₂ CH ₃	4-Cl
0	H	H	H	H	O	3-CF ₃	4-SO ₂ CF ₃	4-CF ₃
0	H	H	H	H	O	3-CF ₃	4-SO ₂ CHF ₂	4-OCF ₃
0	H	H	H	H	O	3-CF ₃	4-SO ₂ CF ₂ Br	4-Cl
0	H	H	H	H	O	3-CF ₃	4-CH ₂ OCH ₃	4-CF ₃
0	H	H	H	H	O	3-CF ₃	4-OCF ₂ CHFOCF ₃	4-OCF ₃
0	H	H	H	H	O	3-CF ₃	4-CH ₂ SCH ₃	4-Cl
0	H	H	H	H	O	3-CF ₃	4-CH ₂ COCH ₃	4-CF ₃
0	H	H	H	H	O	3-CF ₃	4-CH ₂ CO ₂ CH ₃	4-OCF ₃
0	H	H	H	H	O	3-CF ₃	4-OCO ₂ CH ₃	4-Cl
0	H	H	H	H	O	3-CF ₃	4-OCOCH ₃	4-CF ₃

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k	R ¹	R ²	R ³	R ⁴	W	X ₁	Y _m	Z _n
0	H	H	H	H	O	3-CF ₃	4-COCH ₃	4-Cl
0	H	H	H	H	O	3-CF ₃	4-COCF ₃	4-CF ₃
0	H	H	H	H	O	3-CF ₃	4-CO ₂ CH ₂ CH ₃	4-OCF ₃
0	H	H	H	H	O	3-CF ₃	4-CO ₂ C(CH ₃) ₃	4-Cl
0	H	H	H	H	O	3-CF ₃	4-CO ₂ CH ₂ CF ₃	4-CF ₃
0	H	H	H	H	O	3-CF ₃	4-OCH ₂ CO ₂ CH ₃	4-OCF ₃
0	H	H	H	H	O	3-CF ₃	4-NO ₂	4-Cl
0	H	H	H	H	O	3-CF ₃	4-OH	4-CF ₃
0	H	H	H	H	O	3-CF ₃	4-CO ₂ H	4-OCF ₃
0	H	H	H	H	O	3-CF ₃	4-SCN	4-Cl
0	H	H	H	H	O	3-CF ₃	4-OSO ₂ CH ₃	4-CF ₃
0	H	H	H	H	O	3-CF ₃	4-OSO ₂ CF ₃	4-OCF ₃
0	H	H	H	H	O	3-CF ₃	4-CSCH ₃	4-Cl
0	H	H	H	H	O	3-CF ₃	4-NH ₂	4-CF ₃
0	H	H	H	H	O	3-CF ₃	4-N(CH ₃) ₂	4-OCF ₃
0	H	H	H	H	O	3-CF ₃	4-N(CH ₃)CH ₂ CH=CH ₂	4-Cl
0	H	H	H	H	O	3-CF ₃	4-CON(CH ₃) ₂	4-CF ₃
0	H	H	H	H	O	3-CF ₃	4-OCN(CH ₃) ₂	4-OCF ₃
0	H	H	H	H	O	3-CF ₃	4-NHCOCH ₃	4-Cl
0	H	H	H	H	O	3-CF ₃	4-SO ₂ N(CH ₃) ₂	4-CF ₃
0	H	H	H	H	O	3-CF ₃	4-Si(CH ₃) ₃	4-OCF ₃
0	H	H	H	H	O	3-CF ₃	4-C ₆ H ₅	4-Cl
0	H	H	H	H	O	3-CF ₃	4-(C ₆ H ₄ -4-Cl)	4-CF ₃
0	H	H	H	H	O	3-CF ₃	4-OC ₆ H ₅	4-Cl
0	H	H	H	H	O	3-CF ₃	4-O(C ₆ H ₄ -4-CF ₃)	4-CF ₃
0	H	H	H	H	O	3-CF ₃	3-O(C ₆ H ₄ -4-CF ₃)	4-OCF ₃
0	H	H	H	H	O	3-CF ₃	4-S(C ₆ H ₄ -4-CF ₃)	4-Cl
0	H	H	H	H	O	3-CF ₃	4-SO ₂ C ₆ H ₅	4-CF ₃
0	H	H	H	H	O	3-CF ₃	4-NH(C ₆ H ₄ -4-Cl)	4-OCF ₃
0	H	H	H	H	O	3-CF ₃	4-CH ₂ C ₆ H ₅	4-Cl
0	H	H	H	H	O	3-CF ₃	4-COC ₆ H ₅	4-CF ₃
0	H	H	H	H	O	3-CF ₃	4-OCH ₂ (C ₆ H ₄ -4-CF ₃)	4-OCF ₃
0	H	H	H	H	O	3-CF ₃	4-CH ₂ OC ₆ H ₅	4-Cl
0	H	H	H	H	O	3-CF ₃	4-NHCH ₂ C ₆ H ₅	4-CF ₃
0	H	H	H	H	O	3-CF ₃	4-CH ₂ CH ₂ C ₆ H ₅	4-OCF ₃
0	H	H	H	H	O	3-CF ₃	4-N=NC ₆ H ₅	4-Cl
0	H	H	H	H	O	3-CF ₃	4-CH=CHC ₆ H ₅	4-CF ₃
0	H	H	H	H	O	3-CF ₃	2-CH=CH-CH=CH-3	4-OCF ₃
0	H	H	H	H	O	3-CF ₃	3-CH=CH-CH=CH-4	4-Cl
0	H	H	H	H	O	3-CF ₃	3-OCH ₂ O-4	4-CF ₃
0	H	H	H	H	O	3-CF ₃	3-OCF ₂ O-4	4-OCF ₃
0	H	H	H	H	O	3-CF ₃	3-OCH ₂ CH ₂ O-4	4-Cl

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k	R ¹	R ²	R ³	R ⁴	W	X ₁	Y _m	Z _n
0	H	H	H	H	O	3-CF ₃	3-OCF ₂ CF ₂ O-4	4-CF ₃
0	H	H	H	H	O	3-CF ₃	3-OCF ₂ CF ₂ -4	4-OCF ₃
0	H	H	H	H	O	3-CF ₃	3-CF ₂ CF ₂ O-4	4-Cl
0	H	H	H	H	O	3-CF ₃	4-NHSO ₂ CH ₃	4-CF ₃
0	H	H	H	H	O	3-CF ₃	2,3-F ₂	4-Cl
0	H	H	H	H	O	3-CF ₃	2,4-F ₂	4-CF ₃
0	H	H	H	H	O	3-CF ₃	2,5-F ₂	4-OCF ₃
0	H	H	H	H	O	3-CF ₃	2,6-F ₂	4-Cl
0	H	H	H	H	O	3-CF ₃	3,4-F ₂	4-CF ₃
0	H	H	H	H	O	3-CF ₃	3,5-F ₂	4-OCF ₃
0	H	H	H	H	O	3-CF ₃	2,4-Cl ₂	4-Cl
0	H	H	H	H	O	3-CF ₃	3,4-Cl ₂	4-CF ₃
0	H	H	H	H	O	3-CF ₃	3,4-Br ₂	4-OCF ₃
0	H	H	H	H	O	3-CF ₃	2,4-I ₂	4-Cl
0	H	H	H	H	O	3-CF ₃	2,4-(CH ₃) ₂	4-CF ₃
0	H	H	H	H	O	3-CF ₃	3,4-(OCH ₃) ₂	4-OCF ₃
0	H	H	H	H	O	3-CF ₃	2-F-4-Cl	4-Cl
0	H	H	H	H	O	3-CF ₃	2-F-4-Br	4-CF ₃
0	H	H	H	H	O	3-CF ₃	2-F-4-CF ₃	4-OCF ₃
0	H	H	H	H	O	3-CF ₃	2-F-4-OCHF ₂	4-Cl
0	H	H	H	H	O	3-CF ₃	2-F-4-OSO ₂ CF ₃	4-CF ₃
0	H	H	H	H	O	3-CF ₃	2-F-4-O(C ₆ H ₄ -4-Cl)	4-OCF ₃
0	H	H	H	H	O	3-CF ₃	2-F-4-O(Q5-5-CF ₃)	4-Cl
0	H	H	H	H	O	3-CF ₃	3-Cl-4-CF ₃	4-CF ₃
0	H	H	H	H	O	3-CF ₃	3-F-4-OCF ₃	4-OCF ₃
0	H	H	H	H	O	3-CF ₃	3,4-(CF ₃) ₂	4-Cl
0	H	H	H	H	O	3-CF ₃	3,4-(OCF ₃) ₂	4-CF ₃
0	H	H	H	H	O	3-CF ₃	3-CN	4-Cl
0	H	H	H	H	O	3-CF ₃	2-Cl-4-CN	4-CF ₃
0	H	H	H	H	O	3-CF ₃	3-Cl-4-CN	4-OCF ₃
0	H	H	H	H	O	3-CF ₃	2-CH ₃ -4-CN	4-Cl
0	H	H	H	H	O	3-CF ₃	3-CH ₃ -4-CN	4-CF ₃
0	H	H	H	H	O	3-CF ₃	3,4-(CN) ₂	4-OCF ₃
0	H	H	H	H	O	3-CF ₃	2,5-F ₂ -4-Cl	4-Cl
0	H	H	H	H	O	3-CF ₃	3,5-F ₂ -4-CF ₃	4-CF ₃
0	H	H	H	H	O	3-CF ₃	2,3,4-F ₃	4-OCF ₃
0	H	H	H	H	O	3-CF ₃	2,4,5-F ₃	4-Cl
0	H	H	H	H	O	3-CF ₃	3,4,5-F ₃	4-CF ₃
0	H	H	H	H	O	3-CF ₃	2,3,4-Cl ₃	4-OCF ₃
0	H	H	H	H	O	3-CF ₃	2,4,5-Cl ₃	4-Cl
0	H	H	H	H	O	3-CF ₃	2,4,6-Cl ₃	4-CF ₃
0	H	H	H	H	O	3-CF ₃	2-F-4,5-Cl ₂	4-OCF ₃

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k	R ¹	R ²	R ³	R ⁴	W	X ₁	Y _m	Z _n
0	H	H	H	O		3-CF ₃	3-Cl-4-F	4-Cl
0	H	H	H	O		3-CF ₃	2-F-4-OCHF ₂ -5-Cl	4-CF ₃
0	H	H	H	O		3-CF ₃	2,3,4,5-F ₄	4-OCF ₃
0	H	H	H	O		3-CF ₃	2,3,5,6-F ₄	4-Cl
0	H	H	H	O		3-CF ₃	2,4-F ₂ -3,5-Cl ₂	4-CF ₃
0	H	H	H	O		3-CF ₃	2,3,4,5,6-F ₅	4-OCF ₃
0	H	H	H	O		3-CF ₃	2,3,5,6-F ₄ -4-CN	4-Cl
0	H	H	H	O		3-CF ₃	4-NHCONHCH ₃	4-CF ₃
0	H	H	H	O		3-F	3-F	4-Cl
0	H	H	H	O		3-F	3-Cl	4-CF ₃
0	H	H	H	O		3-F	3-Br	4-OCF ₃
0	H	H	H	O		3-F	4-CN	4-Cl
0	H	H	H	O		3-F	4-NO ₂	4-CF ₃
0	H	H	H	O		3-F	4-CH ₃	4-OCF ₃
0	H	H	H	O		3-F	4-CF ₃	4-Cl
0	H	H	H	O		3-F	4-OCH ₂ CH ₃	4-CF ₃
0	H	H	H	O		3-F	4-OCHF ₂	4-OCF ₃
0	H	H	H	O		3-F	4-OCH ₂ CF ₃	4-Cl
0	H	H	H	O		3-F	4-OCF ₂ Br	4-CF ₃
0	H	H	H	O		3-F	4-OCF ₂ CHF ₂	4-OCF ₃
0	H	H	H	O		3-F	4-OSO ₂ CF ₃	4-Cl
0	H	H	H	O		3-F	4-SCHF ₂	4-CF ₃
0	H	H	H	O		3-F	4-SCF ₃	4-OCF ₃
0	H	H	H	O		3-F	4-SCH ₃	4-Cl
0	H	H	H	O		3-F	4-SOCH ₃	4-CF ₃
0	H	H	H	O		3-F	4-SO ₂ CH ₃	4-OCF ₃
0	H	H	H	O		3-F	4-OSO ₂ CH ₃	4-Cl
0	H	H	H	O		3-F	4-NHCOCH ₃	4-CF ₃
0	H	H	H	O		3-F	4-NHSO ₂ CH ₃	4-OCF ₃
0	H	H	H	O		3-F	2,4-Cl ₂	4-Cl
0	H	H	H	O		3-F	3-OCF ₂ O-4	4-CF ₃
0	H	H	H	O		3-OCHF ₂	3-F	4-Cl
0	H	H	H	O		3-OCHF ₂	4-Cl	4-CF ₃
0	H	H	H	O		3-OCHF ₂	4-Br	4-OCF ₃
0	H	H	H	O		3-OCHF ₂	4-CN	4-Cl
0	H	H	H	O		3-OCHF ₂	4-NO ₂	4-CF ₃
0	H	H	H	O		3-OCHF ₂	4-CH ₃	4-OCF ₃
0	H	H	H	O		3-OCHF ₂	4-CF ₃	4-Cl
0	H	H	H	O		3-OCHF ₂	4-OCH ₂ CH ₃	4-CF ₃
0	H	H	H	O		3-OCHF ₂	4-OCHF ₂	4-OCF ₃
0	H	H	H	O		3-OCHF ₂	4-OCH ₂ CF ₃	4-Cl
0	H	H	H	O		3-OCHF ₂	4-OCF ₂ Br	4-CF ₃

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k	R ¹	R ²	R ³	R ⁴	W	X ₁	Y _m	Z _n
0	H	H	H	H	O	3-OCHF ₂	4-OCF ₂ CHF ₂	4-OCF ₃
0	H	H	H	H	O	3-OCHF ₂	4-OSO ₂ CF ₃	4-Cl
0	H	H	H	H	O	3-OCHF ₂	4-SCHF ₂	4-CF ₃
0	H	H	H	H	O	3-OCHF ₂	4-SCF ₃	4-OCF ₃
0	H	H	H	H	O	3-OCHF ₂	4-SCH ₃	4-Cl
0	H	H	H	H	O	3-OCHF ₂	4-SOCH ₃	4-CF ₃
0	H	H	H	H	O	3-OCHF ₂	4-SO ₂ CH ₃	4-OCF ₃
0	H	H	H	H	O	3-OCHF ₂	4-OSO ₂ CH ₃	4-Cl
0	H	H	H	H	O	3-OCHF ₂	4-NHCOCH ₃	4-CF ₃
0	H	H	H	H	O	3-OCHF ₂	4-NHSO ₂ CH ₃	4-OCF ₃
0	H	H	H	H	O	3-OCHF ₂	2,4-Cl ₂	4-Cl
0	H	H	H	H	O	3-OCHF ₂	3-OCF ₂ O-4	4-CF ₃
0	H	H	H	H	O	4-OCHF ₂	3-F	4-Cl
0	H	H	H	H	O	4-OCHF ₂	4-Cl	4-CF ₃
0	H	H	H	H	O	4-OCHF ₂	4-Br	4-OCF ₃
0	H	H	H	H	O	4-OCHF ₂	4-CN	4-Cl
0	H	H	H	H	O	4-OCHF ₂	4-NO ₂	4-CF ₃
0	H	H	H	H	O	4-OCHF ₂	4-CH ₃	4-OCF ₃
0	H	H	H	H	O	4-OCHF ₂	4-CF ₃	4-Cl
0	H	H	H	H	O	4-OCHF ₂	4-OCH ₂ CH ₃	4-CF ₃
0	H	H	H	H	O	4-OCHF ₂	4-OCHF ₂	4-OCF ₃
0	H	H	H	H	O	4-OCHF ₂	4-OCH ₂ CF ₃	4-Cl
0	H	H	H	H	O	4-OCHF ₂	4-OCF ₂ Br	4-CF ₃
0	H	H	H	H	O	4-OCHF ₂	4-OCF ₂ CHF ₂	4-OCF ₃
0	H	H	H	H	O	4-OCHF ₂	4-OSO ₂ CF ₃	4-Cl
0	H	H	H	H	O	4-OCHF ₂	4-SCHF ₂	4-CF ₃
0	H	H	H	H	O	4-OCHF ₂	4-SCF ₃	4-OCF ₃
0	H	H	H	H	O	4-OCHF ₂	4-SCH ₃	4-Cl
0	H	H	H	H	O	4-OCHF ₂	4-SOCH ₃	4-CF ₃
0	H	H	H	H	O	4-OCHF ₂	4-SO ₂ CH ₃	4-OCF ₃
0	H	H	H	H	O	4-OCHF ₂	4-OSO ₂ CH ₃	4-Cl
0	H	H	H	H	O	4-OCHF ₂	4-NHCOCH ₃	4-CF ₃
0	H	H	H	H	O	4-OCHF ₂	4-NHSO ₂ CH ₃	4-OCF ₃
0	H	H	H	H	O	4-OCHF ₂	2,4-Cl ₂	4-Cl
0	H	H	H	H	O	4-OCHF ₂	3-OCF ₂ O-4	4-CF ₃
0	H	H	H	H	O	3-Cl	H	4-Cl
0	H	H	H	H	O	3-Cl	4-Cl	4-CF ₃
0	H	H	H	H	O	3-Cl	4-Br	4-OCF ₃
0	H	H	H	H	O	3-Cl	4-CN	4-Cl
0	H	H	H	H	O	3-Cl	4-NO ₂	4-CF ₃
0	H	H	H	H	O	3-Cl	4-CH ₃	4-OCF ₃
0	H	H	H	H	O	3-Cl	4-CF ₃	4-Cl

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k	R ¹	R ²	R ³	R ⁴	W	X ₁	Y _m	Z _n
0		H	H	H	O	3-Cl	4-OCH ₂ CH ₃	4-CF ₃
0		H	H	H	O	3-Cl	4-OCHF ₂	4-OCF ₃
0		H	H	H	O	3-Cl	4-OCH ₂ CF ₃	4-Cl
0		H	H	H	O	3-Cl	4-OCF ₂ Br	4-CF ₃
0		H	H	H	O	3-Cl	4-OCF ₂ CHF ₂	4-OCF ₃
0		H	H	H	O	3-Cl	4-OSO ₂ CF ₃	4-Cl
0		H	H	H	O	3-Cl	4-SCHF ₂	4-CF ₃
0		H	H	H	O	3-Cl	4-SCF ₃	4-OCF ₃
0		H	H	H	O	3-Cl	4-SCH ₃	4-Cl
0		H	H	H	O	3-Cl	4-SOCH ₃	4-CF ₃
0		H	H	H	O	3-Cl	4-SO ₂ CH ₃	4-OCF ₃
0		H	H	H	O	3-Cl	4-OSO ₂ CH ₃	4-Cl
0		H	H	H	O	3-Cl	4-NHCOCH ₃	4-CF ₃
0		H	H	H	O	3-Cl	4-NHSO ₂ CH ₃	4-OCF ₃
0		H	H	H	O	3-Cl	2,4-Cl ₂	4-Cl
0		H	H	H	O	3-Cl	3-OCF ₂ O-4	4-CF ₃
0		H	H	H	O	3-Br	H	4-Cl
0		H	H	H	O	3-Br	4-Cl	4-CF ₃
0		H	H	H	O	3-Br	4-Br	4-OCF ₃
0		H	H	H	O	3-Br	4-CN	4-Cl
0		H	H	H	O	3-Br	4-NO ₂	4-CF ₃
0		H	H	H	O	3-Br	4-CH ₃	4-OCF ₃
0		H	H	H	O	3-Br	4-CF ₃	4-Cl
0		H	H	H	O	3-Br	4-OCH ₂ CH ₃	4-CF ₃
0		H	H	H	O	3-Br	4-OCHF ₂	4-OCF ₃
0		H	H	H	O	3-Br	4-OCH ₂ CF ₃	4-Cl
0		H	H	H	O	3-Br	4-OCF ₂ Br	4-CF ₃
0		H	H	H	O	3-Br	4-OCF ₂ CHF ₂	4-OCF ₃
0		H	H	H	O	3-Br	4-OSO ₂ CF ₃	4-Cl
0		H	H	H	O	3-Br	4-SCHF ₂	4-CF ₃
0		H	H	H	O	3-Br	4-SCF ₃	4-OCF ₃
0		H	H	H	O	3-Br	4-SCH ₃	4-Cl
0		H	H	H	O	3-Br	4-SOCH ₃	4-CF ₃
0		H	H	H	O	3-Br	4-SO ₂ CH ₃	4-OCF ₃
0		H	H	H	O	3-Br	4-OSO ₂ CH ₃	4-Cl
0		H	H	H	O	3-Br	4-NHCOCH ₃	4-CF ₃
0		H	H	H	O	3-Br	4-NHSO ₂ CH ₃	4-OCF ₃
0		H	H	H	O	3-Br	2,4-Cl ₂	4-Cl
0		H	H	H	O	3-Br	3-OCF ₂ O-4	4-CF ₃
0		H	H	H	O	3,4-F ₂	H	4-Cl
0		H	H	H	O	3,4-F ₂	4-Cl	4-CF ₃
0		H	H	H	O	3,4-F ₂	4-Br	4-OCF ₃

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k	R ¹	R ²	R ³	R ⁴	W	X ₁	Y _m	Z _n
0		H	H	H	O	3,4-F ₂	4-CN	4-Cl
0		H	H	H	O	3,4-F ₂	4-NO ₂	4-CF ₃
0		H	H	H	O	3,4-F ₂	4-CH ₃	4-OCF ₃
0		H	H	H	O	3,4-F ₂	4-CF ₃	4-Cl
0		H	H	H	O	3,4-F ₂	4-OCH ₂ CH ₃	4-CF ₃
0		H	H	H	O	3,4-F ₂	4-OCHF ₂	4-OCF ₃
0		H	H	H	O	3,4-F ₂	4-OCH ₂ CF ₃	4-Cl
0		H	H	H	O	3,4-F ₂	4-OCF ₂ Br	4-CF ₃
0		H	H	H	O	3,4-F ₂	4-OCF ₂ CHF ₂	4-OCF ₃
0		H	H	H	O	3,4-F ₂	4-OSO ₂ CF ₃	4-Cl
0		H	H	H	O	3,4-F ₂	4-SCHF ₂	4-CF ₃
0		H	H	H	O	3,4-F ₂	4-SCF ₃	4-OCF ₃
0		H	H	H	O	3,4-F ₂	4-SCH ₃	4-Cl
0		H	H	H	O	3,4-F ₂	4-SOCH ₃	4-CF ₃
0		H	H	H	O	3,4-F ₂	4-SO ₂ CH ₃	4-OCF ₃
0		H	H	H	O	3,4-F ₂	4-OSO ₂ CH ₃	4-Cl
0		H	H	H	O	3,4-F ₂	4-NHCOCH ₃	4-CF ₃
0		H	H	H	O	3,4-F ₂	4-NHSO ₂ CH ₃	4-OCF ₃
0		H	H	H	O	3,4-F ₂	2,4-Cl ₂	4-Cl
0		H	H	H	O	3,4-F ₂	3-OCF ₂ O-4	4-CF ₃
0		H	H	H	O	4-Cl	4-F	4-Cl
0		H	H	H	O	4-Cl	4-Cl	4-CF ₃
0		H	H	H	O	4-Cl	4-Br	4-OCF ₃
0		H	H	H	O	4-Cl	4-CN	4-Cl
0		H	H	H	O	4-Cl	4-NO ₂	4-CF ₃
0		H	H	H	O	4-Cl	4-CH ₃	4-OCF ₃
0		H	H	H	O	4-Cl	4-CF ₃	4-Cl
0		H	H	H	O	4-Cl	4-OCH ₂ CH ₃	4-CF ₃
0		H	H	H	O	4-Cl	4-OCHF ₂	4-OCF ₃
0		H	H	H	O	4-Cl	4-OCH ₂ CF ₃	4-Cl
0		H	H	H	O	4-Cl	4-OCF ₂ Br	4-CF ₃
0		H	H	H	O	4-Cl	4-OCF ₂ CHF ₂	4-OCF ₃
0		H	H	H	O	4-Cl	4-OSO ₂ CF ₃	4-Cl
0		H	H	H	O	4-Cl	4-SCHF ₂	4-CF ₃
0		H	H	H	O	4-Cl	4-SCF ₃	4-OCF ₃
0		H	H	H	O	4-Cl	4-SCH ₃	4-Cl
0		H	H	H	O	4-Cl	4-SOCH ₃	4-CF ₃
0		H	H	H	O	4-Cl	4-SO ₂ CH ₃	4-OCF ₃
0		H	H	H	O	4-Cl	4-OSO ₂ CH ₃	4-Cl
0		H	H	H	O	4-Cl	4-NHCOCH ₃	4-CF ₃
0		H	H	H	O	4-Cl	4-NHSO ₂ CH ₃	4-OCF ₃
0		H	H	H	O	4-Cl	2,4-Cl ₂	4-Cl

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k	R ¹	R ²	R ³	R ⁴	W	X ₁	Y _m	Z _n
0	H	H	H	H	O	4-Cl	3-OCF ₂ O-4	4-CF ₃
0	H	H	H	H	O	2-F	4-F	4-Cl
0	H	H	H	H	O	2-Cl	4-F	4-CF ₃
0	H	H	H	H	O	4-Cl	4-F	4-OCF ₃
0	H	H	H	H	O	4-Br	4-F	4-Cl
0	H	H	H	H	O	3-I	4-F	4-CF ₃
0	H	H	H	H	O	4-I	4-F	4-OCF ₃
0	H	H	H	H	O	3-CH ₃	4-F	4-Cl
0	H	H	H	H	O	4-CH ₃	4-F	4-CF ₃
0	H	H	H	H	O	4-CH ₂ CH ₃	4-F	4-OCF ₃
0	H	H	H	H	O	3-CH(CH ₃) ₂	4-F	4-Cl
0	H	H	H	H	O	4-CH ₂ CH ₂ CH ₂ CH ₃	4-F	4-CF ₃
0	H	H	H	H	O	4-C(CH ₃) ₃	4-F	4-OCF ₃
0	H	H	H	H	O	3-CH ₂ CH=CH ₂	4-F	4-Cl
0	H	H	H	H	O	4-Q1	4-F	4-CF ₃
0	H	H	H	H	O	4-Q2	4-F	4-OCF ₃
0	H	H	H	H	O	4-Q3	4-F	4-Cl
0	H	H	H	H	O	4-Q4	4-F	4-CF ₃
0	H	H	H	H	O	3-CHF ₂	4-F	4-OCF ₃
0	H	H	H	H	O	4-CHF ₂	4-F	4-Cl
0	H	H	H	H	O	3-CH ₂ Br	4-F	4-CF ₃
0	H	H	H	H	O	3-CH ₂ Cl	4-F	4-OCF ₃
0	H	H	H	H	O	2-CF ₃	4-F	4-Cl
0	H	H	H	H	O	4-CF ₃	4-F	4-CF ₃
0	H	H	H	H	O	4-CH ₂ CN	4-F	4-Cl
0	H	H	H	H	O	4-CH ₂ OH	4-F	4-CF ₃
0	H	H	H	H	O	4-CH ₂ CO ₂ H	4-F	4-OCF ₃
0	H	H	H	H	O	3-OCH ₃	4-F	4-Cl
0	H	H	H	H	O	4-OCH ₃	4-F	4-CF ₃
0	H	H	H	H	O	3-OCH ₂ CH ₃	4-F	4-OCF ₃
0	H	H	H	H	O	4-OCH(CH ₃) ₂	4-F	4-Cl
0	H	H	H	H	O	4-OC(CH ₃) ₃	4-F	4-CF ₃
0	H	H	H	H	O	2-OCHF ₂	4-F	4-OCF ₃
0	H	H	H	H	O	3-OCF ₂ Br	4-F	4-Cl
0	H	H	H	H	O	4-OCF ₂ Br	4-F	4-CF ₃
0	H	H	H	H	O	4-OCF ₃	4-F	4-OCF ₃
0	H	H	H	H	O	3-OCH ₂ CF ₃	4-F	4-Cl
0	H	H	H	H	O	4-OCH ₂ CF ₃	4-F	4-CF ₃
0	H	H	H	H	O	3-OCF ₂ CF ₃	4-F	4-OCF ₃
0	H	H	H	H	O	4-OCF ₂ CF ₃	4-F	4-Cl
0	H	H	H	H	O	2-OCF ₂ CHF ₂	4-F	4-CF ₃
0	H	H	H	H	O	4-OCF ₂ CHF ₂	4-F	4-OCF ₃

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k	R ¹	R ²	R ³	R ⁴	W	X ₁	Y _m	Z _n
0	H	H	H	H	O	3-OCF ₂ CHFCl	4-F	4-Cl
0	H	H	H	H	O	4-OCF ₂ CHFBr	4-F	4-CF ₃
0	H	H	H	H	O	3-OCF ₂ CF ₂ CF ₃	4-F	4-OCF ₃
0	H	H	H	H	O	3-OCH ₂ CH=CHCl	4-F	4-Cl
0	H	H	H	H	O	3-O(Q1-2,2-Cl ₂)	4-F	4-CF ₃
0	H	H	H	H	O	3-SCH ₃	4-F	4-Cl
0	H	H	H	H	O	4-SCH ₃	4-F	4-CF ₃
0	H	H	H	H	O	3-SCHF ₂	4-F	4-OCF ₃
0	H	H	H	H	O	4-SCHF ₂	4-F	4-Cl
0	H	H	H	H	O	3-SCF ₃	4-F	4-CF ₃
0	H	H	H	H	O	4-SCF ₃	4-F	4-OCF ₃
0	H	H	H	H	O	3-SOCH ₃	4-F	4-Cl
0	H	H	H	H	O	4-SOCH ₃	4-F	4-CF ₃
0	H	H	H	H	O	3-SO ₂ CH ₃	4-F	4-OCF ₃
0	H	H	H	H	O	4-SO ₂ CH ₃	4-F	4-Cl
0	H	H	H	H	O	3-SO ₂ CHF ₂	4-F	4-CF ₃
0	H	H	H	H	O	4-CH ₂ OCH ₃	4-F	4-OCF ₃
0	H	H	H	H	O	3-OCF ₂ CHFOCF ₃	4-F	4-Cl
0	H	H	H	H	O	4-OCF ₂ CHFOCF ₃	4-F	4-CF ₃
0	H	H	H	H	O	4-CH ₂ COCH ₃	4-F	4-OCF ₃
0	H	H	H	H	O	4-CH ₂ CO ₂ CH ₃	4-F	4-Cl
0	H	H	H	H	O	4-OCO ₂ CH ₃	4-F	4-CF ₃
0	H	H	H	H	O	3-OCOCH ₃	4-F	4-OCF ₃
0	H	H	H	H	O	4-COCH ₃	4-F	4-Cl
0	H	H	H	H	O	4-COCF ₃	4-F	4-CF ₃
0	H	H	H	H	O	4-CO ₂ CH ₂ CH ₃	4-F	4-OCF ₃
0	H	H	H	H	O	4-CO ₂ C(CH ₃) ₃	4-F	4-Cl
0	H	H	H	H	O	3-CO ₂ CH ₂ CF ₃	4-F	4-CF ₃
0	H	H	H	H	O	3-NO ₂	4-F	4-Cl
0	H	H	H	H	O	4-NO ₂	4-F	4-CF ₃
0	H	H	H	H	O	3-CN	4-F	4-OCF ₃
0	H	H	H	H	O	4-CN	4-F	4-Cl
0	H	H	H	H	O	3-OH	4-F	4-CF ₃
0	H	H	H	H	O	4-OH	4-F	4-OCF ₃
0	H	H	H	H	O	4-SCN	4-F	4-Cl
0	H	H	H	H	O	3-OSO ₂ CH ₃	4-F	4-CF ₃
0	H	H	H	H	O	4-OSO ₂ CH ₃	4-F	4-OCF ₃
0	H	H	H	H	O	3-OSO ₂ CF ₃	4-F	4-Cl
0	H	H	H	H	O	4-OSO ₂ CF ₃	4-F	4-CF ₃
0	H	H	H	H	O	4-CSCH ₃	4-F	4-OCF ₃
0	H	H	H	H	O	4-NH ₂	4-F	4-Cl
0	H	H	H	H	O	4-N(CH ₃) ₂	4-F	4-CF ₃

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k	R ¹	R ²	R ³	R ⁴	W	X ₁	Y _m	Z _n
0	H	H	H	H	O	4-CON(CH ₃) ₂	4-F	4-OCF ₃
0	H	H	H	H	O	3-OCN(CH ₃) ₂	4-F	4-Cl
0	H	H	H	H	O	4-NHCOCH ₃	4-F	4-CF ₃
0	H	H	H	H	O	4-SO ₂ N(CH ₃) ₂	4-F	4-OCF ₃
0	H	H	H	H	O	4-Si(CH ₃) ₃	4-F	4-Cl
0	H	H	H	H	O	4-C ₆ H ₅	4-F	4-CF ₃
0	H	H	H	H	O	3-OC ₆ H ₅	4-F	4-OCF ₃
0	H	H	H	H	O	4-OC ₆ H ₅	4-F	4-Cl
0	H	H	H	H	O	3-SC ₆ H ₅	4-F	4-CF ₃
0	H	H	H	H	O	3-SO ₂ C ₆ H ₅	4-F	4-Cl
0	H	H	H	H	O	3-NHC ₆ H ₅	4-F	4-CF ₃
0	H	H	H	H	O	3-CH ₂ C ₆ H ₅	4-F	4-OCF ₃
0	H	H	H	H	O	3-COC ₆ H ₅	4-F	4-Cl
0	H	H	H	H	O	3-NHSO ₂ CH ₃	4-F	4-CF ₃
0	H	H	H	H	O	2-CH=CH-CH=CH-3	4-F	4-OCF ₃
0	H	H	H	H	O	3-CH=CH-CH=CH-4	4-F	4-Cl
0	H	H	H	H	O	3-OCH ₂ O-4	4-F	4-CF ₃
0	H	H	H	H	O	3-OCF ₂ O-4	4-F	4-OCF ₃
0	H	H	H	H	O	3-OCH ₂ CH ₂ O-4	4-F	4-Cl
0	H	H	H	H	O	3-OCF ₂ CF ₂ O-4	4-F	4-CF ₃
0	H	H	H	H	O	2,3-F ₂	4-F	4-OCF ₃
0	H	H	H	H	O	2,4-F ₂	4-F	4-Cl
0	H	H	H	H	O	2,5-F ₂	4-F	4-CF ₃
0	H	H	H	H	O	3,5-F ₂	4-F	4-OCF ₃
0	H	H	H	H	O	3,4-Cl ₂	4-F	4-Cl
0	H	H	H	H	O	3,5-Cl ₂	4-F	4-CF ₃
0	H	H	H	H	O	3,4-Br ₂	4-F	4-OCF ₃
0	H	H	H	H	O	3,5-I ₂	4-F	4-Cl
0	H	H	H	H	O	2,4-(CH ₃) ₂	4-F	4-CF ₃
0	H	H	H	H	O	3,4-(OCH ₃) ₂	4-F	4-OCF ₃
0	H	H	H	H	O	3,4-(OCF ₃) ₂	4-F	4-Cl
0	H	H	H	H	O	3,5-(OCHF ₂) ₂	4-F	4-CF ₃
0	H	H	H	H	O	3,4-(CF ₃) ₂	4-F	4-Cl
0	H	H	H	H	O	3,5-(CF ₃) ₂	4-F	4-CF ₃
0	H	H	H	H	O	2-F-4-Cl	4-F	4-OCF ₃
0	H	H	H	H	O	3-F-5-Cl	4-F	4-Cl
0	H	H	H	H	O	3-F-5-CF ₃	4-F	4-CF ₃
0	H	H	H	H	O	3-F-5-OCHF ₂	4-F	4-OCF ₃
0	H	H	H	H	O	3-Cl-5-CF ₃	4-F	4-Cl
0	H	H	H	H	O	3-Cl-4-OCHF ₂	4-F	4-CF ₃
0	H	H	H	H	O	3-Cl-4-CN	4-F	4-OCF ₃
0	H	H	H	H	O	3-Cl-4-F	4-F	4-Cl

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k	R ¹	R ²	R ³	R ⁴	W	X ₁	Y _m	Z _n
0		H	H	H	O	3-Cl-5-OSO ₂ CF ₃	4-F	4-CF ₃
0		H	H	H	O	3-F-4-OSO ₂ CF ₃	4-F	4-OCF ₃
0		H	H	H	O	2,3,4-F ₃	4-F	4-Cl
0		H	H	H	O	3,4,5-F ₃	4-F	4-CF ₃
0		H	H	H	O	2,4,5-Cl ₃	4-F	4-OCF ₃
0		H	H	H	O	2,4,6-Cl ₃	4-F	4-Cl
0		H	H	H	O	2-F-4,5-Cl ₂	4-F	4-CF ₃
0		H	H	H	O	3,5-Cl ₂ -4-CF ₃	4-F	4-OCF ₃
0		H	H	H	O	2,3,4,5-F ₄	4-F	4-Cl
0		H	H	H	O	2,3,5,6-F ₄	4-F	4-CF ₃
0		H	H	H	O	2,4-F ₂ -3,5-Cl ₂	4-F	4-OCF ₃
0		H	H	H	O	2,3,4,5,6-F ₅	4-F	4-Cl
0		H	H	H	O	2,3,5,6-F ₄ -4-CN	4-F	4-CF ₃
0		H	H	H	O	4-F	4-Cl	4-Cl
0		H	H	H	O	3-Cl	4-Cl	4-CF ₃
0		H	H	H	O	4-Cl	4-Cl	4-OCF ₃
0		H	H	H	O	3-Br	4-Cl	4-Cl
0		H	H	H	O	3-CH ₃	4-Cl	4-CF ₃
0		H	H	H	O	4-CF ₃	4-Cl	4-OCF ₃
0		H	H	H	O	3-OCH ₃	4-Cl	4-Cl
0		H	H	H	O	3-OCHF ₂	4-Cl	4-CF ₃
0		H	H	H	O	4-OCHF ₂	4-Cl	4-OCF ₃
0		H	H	H	O	3-OCF ₂ Br	4-Cl	4-Cl
0		H	H	H	O	3-OCF ₃	4-Cl	4-CF ₃
0		H	H	H	O	3-OCH ₂ CF ₃	4-Cl	4-OCF ₃
0		H	H	H	O	3-OCF ₂ CHF ₂	4-Cl	4-Cl
0		H	H	H	O	3-SCHF ₂	4-Cl	4-CF ₃
0		H	H	H	O	3-SCF ₃	4-Cl	4-OCF ₃
0		H	H	H	O	3-NO ₂	4-Cl	4-Cl
0		H	H	H	O	3-CN	4-Cl	4-CF ₃
0		H	H	H	O	3-OSO ₂ CH ₃	4-Cl	4-OCF ₃
0		H	H	H	O	3-OSO ₂ CF ₃	4-Cl	4-Cl
0		H	H	H	O	4-OSO ₂ CF ₃	4-Cl	4-CF ₃
0		H	H	H	O	3,4-F ₂	4-Cl	4-OCF ₃
0		H	H	H	O	3,5-F ₂	4-Cl	4-Cl
0		H	H	H	O	3-Cl-4-F	4-Cl	4-CF ₃
0		H	H	H	O	4-F	4-Br	4-Cl
0		H	H	H	O	3-Cl	4-Br	4-CF ₃
0		H	H	H	O	4-Cl	4-Br	4-OCF ₃
0		H	H	H	O	3-Br	4-Br	4-Cl
0		H	H	H	O	3-CH ₃	4-Br	4-CF ₃
0		H	H	H	O	4-CF ₃	4-Br	4-OCF ₃

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k	R ¹	R ²	R ³	R ⁴	W	X ₁	Y _m	Z _n
0	H	H	H	H	O	3-OCH ₃	4-Br	4-Cl
0	H	H	H	H	O	3-OCHF ₂	4-Br	4-CF ₃
0	H	H	H	H	O	4-OCHF ₂	4-Br	4-OCF ₃
0	H	H	H	H	O	3-OCF ₂ Br	4-Br	4-Cl
0	H	H	H	H	O	3-OCF ₃	4-Br	4-CF ₃
0	H	H	H	H	O	3-OCH ₂ CF ₃	4-Br	4-OCF ₃
0	H	H	H	H	O	3-OCF ₂ CHF ₂	4-Br	4-Cl
0	H	H	H	H	O	3-SCHF ₂	4-Br	4-CF ₃
0	H	H	H	H	O	3-SCF ₃	4-Br	4-OCF ₃
0	H	H	H	H	O	3-NO ₂	4-Br	4-Cl
0	H	H	H	H	O	3-CN	4-Br	4-CF ₃
0	H	H	H	H	O	3-OSO ₂ CH ₃	4-Br	4-OCF ₃
0	H	H	H	H	O	3-OSO ₂ CF ₃	4-Br	4-Cl
0	H	H	H	H	O	4-OSO ₂ CF ₃	4-Br	4-CF ₃
0	H	H	H	H	O	3,4-F ₂	4-Br	4-OCF ₃
0	H	H	H	H	O	3,5-F ₂	4-Br	4-Cl
0	H	H	H	H	O	3-Cl-4-F	4-Br	4-CF ₃
0	H	H	H	H	O	4-F	4-CN	4-Cl
0	H	H	H	H	O	2-Cl	4-CN	4-CF ₃
0	H	H	H	H	O	4-Cl	4-CN	4-OCF ₃
0	H	H	H	H	O	3-Br	4-CN	4-Cl
0	H	H	H	H	O	3-CH ₃	4-CN	4-CF ₃
0	H	H	H	H	O	4-CF ₃	4-CN	4-OCF ₃
0	H	H	H	H	O	3-OCH ₃	4-CN	4-Cl
0	H	H	H	H	O	3-OCHF ₂	4-CN	4-CF ₃
0	H	H	H	H	O	4-OCHF ₂	4-CN	4-OCF ₃
0	H	H	H	H	O	3-OCF ₂ Br	4-CN	4-Cl
0	H	H	H	H	O	3-OCF ₃	4-CN	4-CF ₃
0	H	H	H	H	O	3-OCF ₃	4-CN	4-OCF ₃
0	H	H	H	H	O	3-OCH ₂ CF ₃	4-CN	4-OCF ₃
0	H	H	H	H	O	3-OCF ₂ CHF ₂	4-CN	4-Cl
0	H	H	H	H	O	3-SCHF ₂	4-CN	4-CF ₃
0	H	H	H	H	O	3-SCF ₃	4-CN	4-OCF ₃
0	H	H	H	H	O	3-NO ₂	4-CN	4-Cl
0	H	H	H	H	O	3-CN	4-CN	4-CF ₃
0	H	H	H	H	O	3-OSO ₂ CH ₃	4-CN	4-OCF ₃
0	H	H	H	H	O	3-OSO ₂ CF ₃	4-CN	4-Cl
0	H	H	H	H	O	4-OSO ₂ CF ₃	4-CN	4-CF ₃
0	H	H	H	H	O	3,4-F ₂	4-CN	4-OCF ₃
0	H	H	H	H	O	3,5-F ₂	4-CN	4-Cl
0	H	H	H	H	O	3-Cl-4-F	4-CN	4-CF ₃
0	H	H	H	H	O	4-F	4-OHCF ₂	4-Cl

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k	R ¹	R ²	R ³	R ⁴	W	X ₁	Y _m	Z _n
0	H	H	H	H	O	3-Cl	4-OHCF ₂	4-CF ₃
0	H	H	H	H	O	4-Cl	4-OHCF ₂	4-OCF ₃
0	H	H	H	H	O	3-Br	4-OHCF ₂	4-Cl
0	H	H	H	H	O	3-CH ₃	4-OHCF ₂	4-CF ₃
0	H	H	H	H	O	4-CF ₃	4-OHCF ₂	4-OCF ₃
0	H	H	H	H	O	3-OCH ₃	4-OHCF ₂	4-Cl
0	H	H	H	H	O	3-OCHF ₂	4-OHCF ₂	4-CF ₃
0	H	H	H	H	O	4-OCHF ₂	4-OHCF ₂	4-OCF ₃
0	H	H	H	H	O	3-OCF ₂ Br	4-OHCF ₂	4-Cl
0	H	H	H	H	O	3-OCF ₃	4-OHCF ₂	4-CF ₃
0	H	H	H	H	O	3-OCH ₂ CF ₃	4-OHCF ₂	4-OCF ₃
0	H	H	H	H	O	3-OCF ₂ CHF ₂	4-OHCF ₂	4-Cl
0	H	H	H	H	O	3-SCHF ₂	4-OHCF ₂	4-CF ₃
0	H	H	H	H	O	3-SCF ₃	4-OHCF ₂	4-OCF ₃
0	H	H	H	H	O	3-NO ₂	4-OHCF ₂	4-Cl
0	H	H	H	H	O	3-CN	4-OHCF ₂	4-CF ₃
0	H	H	H	H	O	3-OSO ₂ CH ₃	4-OHCF ₂	4-OCF ₃
0	H	H	H	H	O	3-OSO ₂ CF ₃	4-OHCF ₂	4-Cl
0	H	H	H	H	O	4-OSO ₂ CF ₃	4-OHCF ₂	4-CF ₃
0	H	H	H	H	O	3,4-F ₂	4-OHCF ₂	4-OCF ₃
0	H	H	H	H	O	3,5-F ₂	4-OHCF ₂	4-Cl
0	H	H	H	H	O	3-Cl-4-F	4-OHCF ₂	4-CF ₃
0	H	H	H	H	O	4-F	4-OSO ₂ CF ₃	4-Cl
0	H	H	H	H	O	3-Cl	4-OSO ₂ CF ₃	4-CF ₃
0	H	H	H	H	O	4-Cl	4-OSO ₂ CF ₃	4-OCF ₃
0	H	H	H	H	O	3-Br	4-OSO ₂ CF ₃	4-Cl
0	H	H	H	H	O	3-CH ₃	4-OSO ₂ CF ₃	4-CF ₃
0	H	H	H	H	O	4-CF ₃	4-OSO ₂ CF ₃	4-OCF ₃
0	H	H	H	H	O	3-OCH ₃	4-OSO ₂ CF ₃	4-Cl
0	H	H	H	H	O	3-OCHF ₂	4-OSO ₂ CF ₃	4-CF ₃
0	H	H	H	H	O	4-OCHF ₂	4-OSO ₂ CF ₃	4-OCF ₃
0	H	H	H	H	O	3-OCF ₂ Br	4-OSO ₂ CF ₃	4-Cl
0	H	H	H	H	O	3-OCF ₃	4-OSO ₂ CF ₃	4-CF ₃
0	H	H	H	H	O	3-OCH ₂ CF ₃	4-OSO ₂ CF ₃	4-OCF ₃
0	H	H	H	H	O	3-OCF ₂ CHF ₂	4-OSO ₂ CF ₃	4-Cl
0	H	H	H	H	O	3-SCHF ₂	4-OSO ₂ CF ₃	4-CF ₃
0	H	H	H	H	O	3-SCF ₃	4-OSO ₂ CF ₃	4-OCF ₃
0	H	H	H	H	O	3-NO ₂	4-OSO ₂ CF ₃	4-Cl
0	H	H	H	H	O	3-CN	4-OSO ₂ CF ₃	4-CF ₃
0	H	H	H	H	O	3-OSO ₂ CH ₃	4-OSO ₂ CF ₃	4-OCF ₃
0	H	H	H	H	O	3-OSO ₂ CF ₃	4-OSO ₂ CF ₃	4-Cl
0	H	H	H	H	O	4-OSO ₂ CF ₃	4-OSO ₂ CF ₃	4-CF ₃

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k	R ¹	R ²	R ³	R ⁴	W	X ₁	Y _m	Z _n
0	H	H	H	H	O	3,4-F ₂	4-OSO ₂ CF ₃	4-OCF ₃
0	H	H	H	H	O	3,5-F ₂	4-OSO ₂ CF ₃	4-Cl
0	H	H	H	H	O	3-Cl-4-F	4-OSO ₂ CF ₃	4-CF ₃
0	H	H	H	H	O	4-F	4-OCF ₂ CHF ₂	4-Cl
0	H	H	H	H	O	3-Cl	4-OCF ₂ CHF ₂	4-CF ₃
0	H	H	H	H	O	4-Cl	4-OCF ₂ CHF ₂	4-OCF ₃
0	H	H	H	H	O	3-Br	4-OCF ₂ CHF ₂	4-Cl
0	H	H	H	H	O	3-CH ₃	4-OCF ₂ CHF ₂	4-CF ₃
0	H	H	H	H	O	4-CF ₃	4-OCF ₂ CHF ₂	4-OCF ₃
0	H	H	H	H	O	3-OCH ₃	4-OCF ₂ CHF ₂	4-Cl
0	H	H	H	H	O	3-OCHF ₂	4-OCF ₂ CHF ₂	4-CF ₃
0	H	H	H	H	O	4-OCHF ₂	4-OCF ₂ CHF ₂	4-OCF ₃
0	H	H	H	H	O	3-OCF ₂ Br	4-OCF ₂ CHF ₂	4-Cl
0	H	H	H	H	O	3-OCF ₃	4-OCF ₂ CHF ₂	4-CF ₃
0	H	H	H	H	O	3-OCH ₂ CF ₃	4-OCF ₂ CHF ₂	4-OCF ₃
0	H	H	H	H	O	3-OCF ₂ CHF ₂	4-OCF ₂ CHF ₂	4-Cl
0	H	H	H	H	O	3-SCHF ₂	4-OCF ₂ CHF ₂	4-CF ₃
0	H	H	H	H	O	3-SCF ₃	4-OCF ₂ CHF ₂	4-OCF ₃
0	H	H	H	H	O	3-NO ₂	4-OCF ₂ CHF ₂	4-Cl
0	H	H	H	H	O	3-CN	4-OCF ₂ CHF ₂	4-CF ₃
0	H	H	H	H	O	3-OSO ₂ CH ₃	4-OCF ₂ CHF ₂	4-OCF ₃
0	H	H	H	H	O	3-OSO ₂ CF ₃	4-OCF ₂ CHF ₂	4-Cl
0	H	H	H	H	O	4-OSO ₂ CF ₃	4-OCF ₂ CHF ₂	4-CF ₃
0	H	H	H	H	O	3,4-F ₂	4-OCF ₂ CHF ₂	4-OCF ₃
0	H	H	H	H	O	3,5-F ₂	4-OCF ₂ CHF ₂	4-Cl
0	H	H	H	H	O	3-Cl-4-F	4-OCF ₂ CHF ₂	4-CF ₃
0	H	H	H	H	O	4-F	2,4-F ₂	4-Cl
0	H	H	H	H	O	3-Cl	2,4-F ₂	4-CF ₃
0	H	H	H	H	O	4-Cl	2,4-F ₂	4-OCF ₃
0	H	H	H	H	O	3-Br	2,4-F ₂	4-Cl
0	H	H	H	H	O	3-CH ₃	2,4-F ₂	4-CF ₃
0	H	H	H	H	O	4-CF ₃	2,4-F ₂	4-OCF ₃
0	H	H	H	H	O	3-OCH ₃	2,4-F ₂	4-Cl
0	H	H	H	H	O	3-OCHF ₂	2,4-F ₂	4-CF ₃
0	H	H	H	H	O	4-OCHF ₂	2,4-F ₂	4-OCF ₃
0	H	H	H	H	O	3-OCF ₂ Br	2,4-F ₂	4-Cl
0	H	H	H	H	O	3-OCF ₃	2,4-F ₂	4-CF ₃
0	H	H	H	H	O	3-OCH ₂ CF ₃	2,4-F ₂	4-OCF ₃
0	H	H	H	H	O	3-OCF ₂ CHF ₂	2,4-F ₂	4-Cl
0	H	H	H	H	O	3-SCHF ₂	2,4-F ₂	4-CF ₃
0	H	H	H	H	O	3-SCF ₃	2,4-F ₂	4-OCF ₃
0	H	H	H	H	O	3-NO ₂	2,4-F ₂	4-Cl

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k	R ¹	R ²	R ³	R ⁴	W	X ₁	Y _m	Z _n
0	H	H	H	H	O	3-CN	2,4-F ₂	4-CF ₃
0	H	H	H	H	O	3-OSO ₂ CH ₃	2,4-F ₂	4-OCF ₃
0	H	H	H	H	O	3-OSO ₂ CF ₃	2,4-F ₂	4-Cl
0	H	H	H	H	O	4-OSO ₂ CF ₃	2,4-F ₂	4-CF ₃
0	H	H	H	H	O	3,4-F ₂	2,4-F ₂	4-OCF ₃
0	H	H	H	H	O	3,5-F ₂	2,4-F ₂	4-Cl
0	H	H	H	H	O	3-Cl-4-F	2,4-F ₂	4-CF ₃
0	H	H	H	H	O	4-F	3,4-F ₂	4-Cl
0	H	H	H	H	O	3-Cl	3,4-F ₂	4-CF ₃
0	H	H	H	H	O	4-Cl	3,4-F ₂	4-OCF ₃
0	H	H	H	H	O	3-Br	3,4-F ₂	4-Cl
0	H	H	H	H	O	3-CH ₃	3,4-F ₂	4-CF ₃
0	H	H	H	H	O	4-CF ₃	3,4-F ₂	4-OCF ₃
0	H	H	H	H	O	3-OCH ₃	3,4-F ₂	4-Cl
0	H	H	H	H	O	3-OCHF ₂	3,4-F ₂	4-CF ₃
0	H	H	H	H	O	4-OCHF ₂	3,4-F ₂	4-OCF ₃
0	H	H	H	H	O	3-OCF ₂ Br	3,4-F ₂	4-Cl
0	H	H	H	H	O	3-OCF ₃	3,4-F ₂	4-CF ₃
0	H	H	H	H	O	3-OCH ₂ CF ₃	3,4-F ₂	4-OCF ₃
0	H	H	H	H	O	3-OCF ₂ CHF ₂	3,4-F ₂	4-Cl
0	H	H	H	H	O	3-SCHF ₂	3,4-F ₂	4-CF ₃
0	H	H	H	H	O	3-SCF ₃	3,4-F ₂	4-OCF ₃
0	H	H	H	H	O	3-NO ₂	3,4-F ₂	4-Cl
0	H	H	H	H	O	3-CN	3,4-F ₂	4-CF ₃
0	H	H	H	H	O	3-OSO ₂ CH ₃	3,4-F ₂	4-OCF ₃
0	H	H	H	H	O	3-OSO ₂ CF ₃	3,4-F ₂	4-Cl
0	H	H	H	H	O	4-OSO ₂ CF ₃	3,4-F ₂	4-CF ₃
0	H	H	H	H	O	3,4-F ₂	3,4-F ₂	4-OCF ₃
0	H	H	H	H	O	3,5-F ₂	3,4-F ₂	4-Cl
0	H	H	H	H	O	3-Cl-4-F	3,4-F ₂	4-CF ₃
0	H	H	H	H	S	3-F	4-F	4-Cl
0	H	H	H	H	S	3-F	4-F	4-Br
0	H	H	H	H	S	3-F	4-F	4-CF ₃
0	H	H	H	H	S	3-F	4-F	4-OCF ₃
0	H	H	H	H	S	3-F	4-F	4-OCHF ₂
0	H	H	H	H	S	3-F	4-F	4-OCF ₂ Br
0	H	H	H	H	S	3-F	4-F	4-OCF ₂ CHF ₂
0	H	H	H	H	S	3-F	4-F	4-OSO ₂ CF ₃
0	H	H	H	H	S	H	4-F	4-OCF ₃
0	H	H	H	H	S	4-F	4-F	4-Cl
0	H	H	H	H	S	3-Cl	4-F	4-CF ₃
0	H	H	H	H	S	3-Br	4-F	4-OCF ₃

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k	R ¹	R ²	R ³	R ⁴	W	X ₁	Y _m	Z _n
0		H	H	H	S	3-CF ₃	4-F	4-Cl
0		H	H	H	S	3-OCF ₃	4-F	4-CF ₃
0		H	H	H	S	3-OCHF ₂	4-F	4-OCF ₃
0		H	H	H	S	4-OCHF ₂	4-F	4-Cl
0		H	H	H	S	3-F	4-Cl	4-CF ₃
0		H	H	H	S	3-F	4-Br	4-OCF ₃
0		H	H	H	S	3-F	4-CF ₃	4-Cl
0		H	H	H	S	3-F	4-OSO ₂ CF ₃	4-CF ₃
0		H	H	H	S	3-F	4-CN	4-OCF ₃
0		H	H	H	S	3-F	3,4-F ₂	4-Cl
0		H	H	H	S	3-CF ₃	4-CN	4-CF ₃
0		H	H	CH ₃	O	3-F	4-F	4-Cl
0		H	H	CH ₃	O	3-F	4-F	4-Br
0		H	H	CH ₃	O	3-F	4-F	4-CF ₃
0		H	H	CH ₃	O	3-F	4-F	4-OCF ₃
0		H	H	CH ₃	O	3-F	4-F	4-OCHF ₂
0		H	H	CH ₃	O	3-F	4-F	4-OCF ₂ Br
0		H	H	CH ₃	O	3-F	4-F	4-OCF ₂ CHF ₂
0		H	H	CH ₃	O	3-F	4-F	4-OSO ₂ CF ₃
0		H	H	CH ₃	O	H	4-F	4-OCF ₃
0		H	H	CH ₃	S	4-F	4-F	4-Cl
0		H	H	CH ₃	O	3-Cl	4-F	4-CF ₃
0		H	H	CH ₃	O	3-Br	4-F	4-OCF ₃
0		H	H	CH ₃	O	3-CF ₃	4-F	4-Cl
0		H	H	CH ₃	O	3-OCF ₃	4-F	4-CF ₃
0		H	H	CH ₃	O	3-OCHF ₂	4-F	4-OCF ₃
0		H	H	CH ₃	O	4-OCHF ₂	4-F	4-Cl
0		H	H	CH ₃	S	3-F	4-Cl	4-CF ₃
0		H	H	CH ₃	O	3-F	4-Br	4-OCF ₃
0		H	H	CH ₃	O	3-F	4-CF ₃	4-Cl
0		H	H	CH ₃	O	3-F	4-OSO ₂ CF ₃	4-CF ₃
0		H	H	CH ₃	O	3-F	4-CN	4-OCF ₃
0		H	H	CH ₃	O	3-F	3,4-F ₂	4-Cl
0		H	H	CH ₃	O	3-CF ₃	4-CN	4-CF ₃
0		H	CH ₃	H	O	3-F	4-F	4-Cl
0		H	CH ₃	H	O	3-F	4-F	4-Br
0		H	CH ₃	H	O	3-F	4-F	4-CF ₃
0		H	CH ₃	H	O	3-F	4-F	4-OCF ₃
0		H	CH ₃	H	O	3-F	4-F	4-OCHF ₂
0		H	CH ₃	H	O	3-F	4-F	4-OCF ₂ Br
0		H	CH ₃	H	O	3-F	4-F	4-OCF ₂ CHF ₂
0		H	CH ₃	H	O	3-F	4-F	4-OSO ₂ CF ₃

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k	R ¹	R ²	R ³	R ⁴	W	X ₁	Y _m	Z _n
0		H	CH ₃	H	O	H	4-F	4-OCF ₃
0		H	CH ₃	H	S	4-F	4-F	4-Cl
0		H	CH ₃	H	O	3-Cl	4-F	4-CF ₃
0		H	CH ₃	H	O	3-Br	4-F	4-OCF ₃
0		H	CH ₃	H	O	3-CF ₃	4-F	4-Cl
0		H	CH ₃	H	O	3-OCF ₃	4-F	4-CF ₃
0		H	CH ₃	H	O	3-OCHF ₂	4-F	4-OCF ₃
0		H	CH ₃	H	O	4-OCHF ₂	4-F	4-Cl
0		H	CH ₃	H	S	3-F	4-Cl	4-CF ₃
0		H	CH ₃	H	O	3-F	4-Br	4-OCF ₃
0		H	CH ₃	H	O	3-F	4-CF ₃	4-Cl
0		H	CH ₃	H	O	3-F	4-OSO ₂ CF ₃	4-CF ₃
0		H	CH ₃	H	O	3-F	4-CN	4-OCF ₃
0		H	CH ₃	H	O	3-F	3,4-F ₂	4-Cl
0		H	CH ₃	H	O	3-CF ₃	4-CN	4-CF ₃
0		CH ₃	H	H	O	3-F	4-F	4-Cl
0		CH ₃	H	H	O	3-F	4-F	4-Br
0		CH ₃	H	H	O	3-F	4-F	4-CF ₃
0		CH ₃	H	H	O	3-F	4-F	4-OCF ₃
0		CH ₃	H	H	O	3-F	4-F	4-OCHF ₂
0		CH ₃	H	H	O	3-F	4-F	4-OCF ₂ Br
0		CH ₃	H	H	O	3-F	4-F	4-OCF ₂ CHF ₂
0		CH ₃	H	H	O	3-F	4-F	4-OSO ₂ CF ₃
0		CH ₃	H	H	O	H	4-F	4-OCF ₃
0		CH ₃	H	H	S	4-F	4-F	4-Cl
0		CH ₃	H	H	O	3-Cl	4-F	4-CF ₃
0		CH ₃	H	H	O	3-Br	4-F	4-OCF ₃
0		CH ₃	H	H	O	3-CF ₃	4-F	4-Cl
0		CH ₃	H	H	O	3-OCF ₃	4-F	4-CF ₃
0		CH ₃	H	H	O	3-OCHF ₂	4-F	4-OCF ₃
0		CH ₃	H	H	O	4-OCHF ₂	4-F	4-Cl
0		CH ₃	H	H	S	3-F	4-Cl	4-CF ₃
0		CH ₃	H	H	O	3-F	4-Br	4-OCF ₃
0		CH ₃	H	H	O	3-F	4-CF ₃	4-Cl
0		CH ₃	H	H	O	3-F	4-OSO ₂ CF ₃	4-CF ₃
0		CH ₃	H	H	O	3-F	4-CN	4-OCF ₃
0		CH ₃	H	H	O	3-F	3,4-F ₂	4-Cl
0		CH ₃	H	H	O	3-CF ₃	4-CN	4-CF ₃

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k	R ¹	R ²	R ³	R ⁴	W	X ₁	Y _m	Z _n
0	H		H	CH ₂ CH ₃	O	3-F	4-F	4-Cl
0	H		H	CH ₂ CH ₂ CH ₃	O	3-F	4-F	4-Br
0	H		H	CH ₂ CH ₂ CH ₂ CH ₃	O	3-F	4-F	4-CF ₃
0	H		H	CH(CH ₃) ₂	O	3-F	4-F	4-OCF ₃
0	H		H	C(CH ₃) ₃	O	3-F	4-F	4-OCHF ₂
0	H		H	CH ₂ CH=CH ₂	O	3-F	4-F	4-OCF ₂ Br
0	H		H	CH ₂ C≡CH	O	3-F	4-F	4-OCF ₂ CHF ₂
0	H		H	CH ₂ OCH ₃	O	3-F	4-F	4-OSO ₂ CF ₃
0	H		H	CH ₂ OCH ₂ CH ₃	O	H	4-F	4-OCF ₃
0	H		H	CH ₂ CH ₂ OCH ₃	O	4-F	4-F	4-Cl
0	H		H	CHF ₂	O	3-Cl	4-F	4-CF ₃
0	H		H	CBrF ₂	O	3-Br	4-F	4-OCF ₃
0	H		H	CF ₃	O	3-CF ₃	4-F	4-Cl
0	H		H	COCH ₃	O	3-OCF ₃	4-F	4-CF ₃
0	H		H	COCF ₃	O	3-OCHF ₂	4-F	4-OCF ₃
0	H		H	CO ₂ CH ₃	O	4-OCHF ₂	4-F	4-Cl
0	H		H	CH ₂ C ₆ H ₅	O	3-F	4-Cl	4-CF ₃
0	H		H	SC ₆ H ₅	O	3-F	4-Br	4-OCF ₃
0	H		H	SCCl ₃	O	3-F	4-CF ₃	4-Cl
0	H		H	SCO ₂ CH ₂ CH ₃	O	3-F	4-OSO ₂ CF ₃	4-CF ₃
0	H		H	S(C ₆ H ₄ -2-NO ₂)	O	3-F	4-CN	4-OCF ₃
0	H		H	SN(CH ₂ CH ₂ CH ₂ CH ₃) ₂	O	3-F	3,4-F ₂	4-Cl
0	H		H	SN(CH ₃)CO ₂ CH ₂ CH ₃	O	3-CF ₃	4-CN	4-CF ₃
0	H	CH ₂ CH ₃	H		O	3-F	4-F	4-Cl
0	H	CH ₂ CH ₂ CH ₃	H		O	3-F	4-F	4-Br
0	H	CH ₂ CH ₂ CH ₂ CH ₃	H		O	3-F	4-F	4-CF ₃
0	H	CH(CH ₃) ₂	H		O	3-F	4-F	4-OCF ₃
0	H	C(CH ₃) ₃	H		O	3-F	4-F	4-OCHF ₂
0	H	CH ₂ CH=CH ₂	H		O	3-F	4-F	4-OCF ₂ Br
0	H	CH ₂ C≡CH	H		O	3-F	4-F	4-OCF ₂ CHF ₂
0	H	CH ₂ OCH ₃	H		O	3-F	4-F	4-OSO ₂ CF ₃
0	H	CH ₂ OCH ₂ CH ₃	H		O	H	4-F	4-OCF ₃
0	H	CH ₂ CH ₂ OCH ₃	H		O	4-F	4-F	4-Cl
0	H	CHF ₂	H		O	3-Cl	4-F	4-CF ₃
0	H	CBrF ₂	H		O	3-Br	4-F	4-OCF ₃
0	H	CF ₃	H		O	3-CF ₃	4-F	4-Cl
0	H	COCH ₃	H		O	3-OCF ₃	4-F	4-CF ₃
0	H	COCF ₃	H		O	3-OCHF ₂	4-F	4-OCF ₃
0	H	CO ₂ CH ₃	H		O	4-OCHF ₂	4-F	4-Cl
0	H	CH ₂ C ₆ H ₅	H		O	3-F	4-Cl	4-CF ₃
0	H	SC ₆ H ₅	H		O	3-F	4-Br	4-OCF ₃
0	H	SCCl ₃	H		O	3-F	4-CF ₃	4-Cl

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k	R ¹	R ²	R ³	R ⁴	W	X ₁	Y _m	Z _n
0		H	SCO ₂ CH ₂ CH ₃	H	O	3-F	4-OSO ₂ CF ₃	4-CF ₃
0		H	S(C ₆ H ₄ -2-NO ₂)	H	O	3-F	4-CN	4-OCF ₃
0		H	SN(CH ₂ CH ₂ CH ₂ CH ₃) ₂	H	O	3-F	3,4-F ₂	4-Cl
0		H	SN(CH ₃)CO ₂ CH ₂ CH ₃	H	O	3-CF ₃	4-CN	4-CF ₃
0		CH ₂ CH ₃	H	H	O	3-F	4-F	4-Cl
0		CH ₂ CH ₂ CH ₃	H	H	O	3-F	4-F	4-Br
0		CH ₂ CH ₂ CH ₂ CH ₃	H	H	O	3-F	4-F	4-CF ₃
0		CH(CH ₃) ₂	H	H	O	3-F	4-F	4-OCF ₃
0		C(CH ₃) ₃	H	H	O	3-F	4-F	4-OCHF ₂
0		Q1	H	H	O	3-F	4-F	4-OCF ₂ Br
0		Q4	H	H	O	3-F	4-F	4-OCF ₂ CHF ₂
0		F	H	H	O	3-F	4-F	4-OSO ₂ CF ₃
0		Cl	H	H	O	H	4-F	4-OCF ₃
0		Br	H	H	O	4-F	4-F	4-Cl
0		I	H	H	O	3-Cl	4-F	4-CF ₃
0		OH	H	H	O	3-Br	4-F	4-OCF ₃
0		CN	H	H	O	3-CF ₃	4-F	4-Cl
0		NO ₂	H	H	O	3-OCF ₃	4-F	4-CF ₃
0		CH ₂ F	H	H	O	3-OCHF ₂	4-F	4-OCF ₃
0		CF ₃	H	H	O	4-OCHF ₂	4-F	4-Cl
0		OCH ₃	H	H	O	3-F	4-Cl	4-CF ₃
0		OCH ₂ CH ₃	H	H	O	3-F	4-Br	4-OCF ₃
0		OCF ₃	H	H	O	3-F	4-CF ₃	4-Cl
0		SCH ₃	H	H	O	3-F	4-OSO ₂ CF ₃	4-CF ₃
0		SCF ₃	H	H	O	3-F	4-CN	4-OCF ₃
0		SO ₂ CH ₃	H	H	O	3-F	3,4-F ₂	4-Cl
0		SO ₂ CF ₃	H	H	O	3-CF ₃	4-CN	4-CF ₃
0		OSO ₂ CF ₃	H	H	O	3-F	4-F	4-Cl
0		CO ₂ CH ₂ CH ₃	H	H	O	3-F	4-F	4-Br
0		CO ₂ CH ₃	H	H	O	3-F	4-F	4-CF ₃
0		CH ₂ CO ₂ CH ₃	H	H	O	3-F	4-F	4-OCF ₃
0		N(CH ₃) ₂	H	H	O	3-F	4-F	4-OCHF ₂
0		C ₆ H ₅	H	H	O	3-F	4-F	4-OCF ₂ Br
0		C ₆ H ₄ -4-F	H	H	O	3-F	4-F	4-OCF ₂ CHF ₂
0		C ₆ H ₄ -4-Cl	H	H	O	3-F	4-F	4-OSO ₂ CF ₃
0		C ₆ H ₄ -4-Br	H	H	O	H	4-F	4-OCF ₃
0		C ₆ H ₄ -4-CN	H	H	O	4-F	4-F	4-Cl
0		C ₆ H ₄ -4-CF ₃	H	H	O	3-Cl	4-F	4-CF ₃
0		CH ₂ C ₆ H ₅	H	H	O	3-Br	4-F	4-OCF ₃
0		CH ₃	CH ₃	CH ₃	O	3-F	4-F	4-Cl
0		CH ₃	CH ₃	CH ₃	O	3-F	4-F	4-Br
0		CH ₃	CH ₃	CH ₃	O	3-F	4-F	4-CF ₃

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k	R ¹	R ²	R ³	R ⁴	W	X ₁	Y _m	Z _n
0		CH ₃	CH ₃	CH ₃	O	3-F	4-F	4-OCF ₃
0		CH ₃	CH ₃	CH ₃	O	3-F	4-F	4-OCHF ₂
0		CH ₃	CH ₃	CH ₃	O	3-F	4-F	4-OCF ₂ Br
0		CH ₃	CH ₃	CH ₃	O	3-F	4-F	4-OCF ₂ CHF ₂
0		CH ₃	CH ₃	CH ₃	O	3-F	4-F	4-OSO ₂ CF ₃
0		CH ₃	CH ₃	CH ₃	O	H	4-F	4-OCF ₃
0		CH ₃	CH ₃	CH ₃	O	4-F	4-F	4-Cl
0		CH ₃	CH ₃	CH ₃	O	3-Cl	4-F	4-CF ₃
0	H		CH ₂ OCH ₃	CH ₃	O	3-F	4-F	4-Cl
0	H		COCH ₃	CH ₃	O	3-F	4-F	4-Br
0	H		CO ₂ CH ₃	CH ₃	O	3-F	4-F	4-CF ₃
0	H		CHF ₂	CH ₃	O	3-F	4-F	4-OCF ₃
0	H		CH ₂ C ₆ H ₅	CH ₃	O	3-F	4-F	4-OCHF ₂
0	H		SC ₆ H ₅	CH ₃	O	3-F	4-F	4-OCF ₂ Br
0	H		CH ₃	CH ₂ OCH ₃	O	3-F	4-F	4-OCF ₂ CHF ₂
0	H		CH ₃	COCH ₃	O	3-F	4-F	4-OSO ₂ CF ₃
0	H		CH ₃	CO ₂ CH ₃	O	H	4-F	4-OCF ₃
0	H		CH ₃	CHF ₂	O	4-F	4-F	4-Cl
0	H		CH ₃	CH ₂ C ₆ H ₅	O	3-Cl	4-F	4-CF ₃
0	H		CH ₃	SC ₆ H ₅	O	3-Br	4-F	4-OCF ₃
0	CH ₃		CH ₃	CH ₂ OCH ₃	O	3-CF ₃	4-F	4-Cl
0	CH ₃		CH ₃	COCH ₃	O	3-OCF ₃	4-F	4-CF ₃
0	CH ₃		CH ₃	CO ₂ CH ₃	O	3-OCHF ₂	4-F	4-OCF ₃
0	CH ₃		CH ₃	CHF ₂	O	4-OCHF ₂	4-F	4-Cl
0	CH ₃		CH ₃	CH ₂ C ₆ H ₅	O	3-F	4-Cl	4-CF ₃
0	C ₆ H ₅		CH ₃	SC ₆ H ₅	O	3-F	4-Br	4-OCF ₃
0	Br		CH ₃	CH ₃	O	3-F	4-CF ₃	4-Cl
0	CN		CH ₃	CH ₃	O	3-F	4-OSO ₂ CF ₃	4-CF ₃
0	OH		CH ₃	CH ₃	O	3-F	4-CN	4-OCF ₃
0	C ₆ H ₅		CH ₃	CH ₃	O	3-F	3,4-F ₂	4-Cl
0	CH ₂ C ₆ H ₅		CH ₃	CH ₃	O	3-CF ₃	4-CN	4-CF ₃
0	CH ₃		CH ₃	CH ₃	O	3-F	4-F	4-OCF ₃
0	CH ₃		CH ₃	CH ₃	O	3-F	4-F	4-OCHF ₂
0	CH ₃		CH ₃	CH ₃	O	3-F	4-F	4-OCF ₂ Br
0	CH ₃		CH ₃	CH ₃	O	3-F	4-F	4-OCF ₂ CHF ₂
0	CH ₃		CH ₃	CH ₃	O	3-F	4-F	4-OSO ₂ CF ₃
0	CH ₃		CH ₃	CH ₃	O	H	4-F	4-OCF ₃
0	CH ₃		CH ₃	CH ₃	O	4-F	4-F	4-Cl
0	CH ₃		CH ₃	CH ₃	O	3-Cl	4-F	4-CF ₃
0	H		CH ₂ OCH ₃	CH ₃	O	3-F	4-F	4-Cl
0	H		COCH ₃	CH ₃	O	3-F	4-F	4-Br
0	H		CO ₂ CH ₃	CH ₃	O	3-F	4-F	4-CF ₃

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k	R ¹	R ²	R ³	R ⁴	W	X ₁	Y _m	Z _n
0		H	CHF ₂	CH ₃	O	3-F	4-F	4-OCF ₃
0		H	CH ₂ C ₆ H ₅	CH ₃	O	3-F	4-F	4-OCHF ₂
0		H	SC ₆ H ₅	CH ₃	O	3-F	4-F	4-OCF ₂ Br
0		H	CH ₃	CH ₂ OCH ₃	O	3-F	4-F	4-OCF ₂ CHF ₂
0		H	CH ₃	COCH ₃	O	3-F	4-F	4-OSO ₂ CF ₃
0		H	CH ₃	CO ₂ CH ₃	O	H	4-F	4-OCF ₃
0		H	CH ₃	CHF ₂	O	4-F	4-F	4-Cl
0		H	CH ₃	CH ₂ C ₆ H ₅	O	3-Cl	4-F	4-CF ₃
0		H	CH ₃	SC ₆ H ₅	O	3-Br	4-F	4-OCF ₃
0		CH ₃	CH ₃	CH ₂ OCH ₃	O	3-CF ₃	4-F	4-Cl
0		CH ₃	CH ₃	COCH ₃	O	3-OCF ₃	4-F	4-CF ₃
0		CH ₃	CH ₃	CO ₂ CH ₃	O	3-OCHF ₂	4-F	4-OCF ₃
0		CH ₃	CH ₃	CHF ₂	O	4-OCHF ₂	4-F	4-Cl
0		CH ₃	CH ₃	CH ₂ C ₆ H ₅	O	3-F	4-Cl	4-CF ₃
0		C ₆ H ₅	CH ₃	SC ₆ H ₅	O	3-F	4-Br	4-OCF ₃
0		Br	CH ₃	CH ₃	O	3-F	4-CF ₃	4-Cl
0		CN	CH ₃	CH ₃	O	3-F	4-OSO ₂ CF ₃	4-CF ₃
0		OH	CH ₃	CH ₃	O	3-F	4-CN	4-OCF ₃
0		C ₆ H ₅	CH ₃	CH ₃	O	3-F	3,4-F ₂	4-Cl
0		CH ₂ C ₆ H ₅	CH ₃	CH ₃	O	3-CF ₃	4-CN	4-CF ₃

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k	R ¹	R ²	R ³	R ⁴	W	X ₁	Y _m	Z _n
1	H	H	H	H	O	3-F	4-F	4-Cl
1	H	H	H	H	O	3-F	4-F	4-Br
1	H	H	H	H	O	3-F	4-F	4-CF ₃
1	H	H	H	H	O	3-F	4-F	4-OCF ₃
1	H	H	H	H	O	3-F	4-F	4-OCHF ₂
1	H	H	H	H	O	3-F	4-F	4-OCF ₂ Br
1	H	H	H	H	O	3-F	4-F	4-OCF ₂ CHF ₂
1	H	H	H	H	O	3-F	4-F	4-OSO ₂ CF ₃
1	H	H	H	H	O	H	4-F	4-OCF ₃
1	H	H	H	H	O	4-F	4-F	4-Cl
1	H	H	H	H	O	3-Cl	4-F	4-CF ₃
1	H	H	H	H	O	3-Br	4-F	4-OCF ₃
1	H	H	H	H	O	3-CF ₃	4-F	4-Cl
1	H	H	H	H	O	3-OCF ₃	4-F	4-CF ₃
1	H	H	H	H	O	3-OCHF ₂	4-F	4-OCF ₃
1	H	H	H	H	O	4-OCHF ₂	4-F	4-Cl
1	H	H	H	H	O	3-F	4-Cl	4-CF ₃
1	H	H	H	H	O	3-F	4-Br	4-OCF ₃
1	H	H	H	H	O	3-F	4-CF ₃	4-Cl
1	H	H	H	H	O	3-F	4-OSO ₂ CF ₃	4-CF ₃
1	H	H	H	H	O	3-F	4-CN	4-OCF ₃
1	H	H	H	H	O	3-F	3,4-F ₂	4-Cl
1	H	H	H	H	O	3-CF ₃	4-CN	4-CF ₃
1	CH ₃	H	H	H	O	3-F	4-F	4-Cl
1	CH ₃	H	H	H	O	3-F	4-F	4-Br
1	CH ₃	H	H	H	O	3-F	4-F	4-CF ₃
1	CH ₃	H	H	H	O	3-F	4-F	4-OCF ₃
1	CH ₃	H	H	H	O	3-F	4-F	4-OCHF ₂
1	CH ₃	H	H	H	O	3-F	4-F	4-OCF ₂ Br
1	CH ₃	H	H	H	O	3-F	4-F	4-OCF ₂ CHF ₂
1	CH ₃	H	H	H	O	3-F	4-F	4-OSO ₂ CF ₃
1	CH ₃	H	H	H	O	H	4-F	4-OCF ₃
1	CH ₃	H	H	H	O	4-F	4-F	4-Cl
1	CH ₃	H	H	H	O	3-Cl	4-F	4-CF ₃
1	CH ₃	H	H	H	O	3-Br	4-F	4-OCF ₃
1	CH ₃	H	H	H	O	3-CF ₃	4-F	4-Cl
1	CH ₃	H	H	H	O	3-OCF ₃	4-F	4-CF ₃
1	CH ₃	H	H	H	O	3-OCHF ₂	4-F	4-OCF ₃
1	CH ₃	H	H	H	O	4-OCHF ₂	4-F	4-Cl
1	CH ₃	H	H	H	O	3-F	4-Cl	4-CF ₃
1	CH ₃	H	H	H	O	3-F	4-Br	4-OCF ₃
1	CH ₃	H	H	H	O	3-F	4-CF ₃	4-Cl

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k	R ¹	R ²	R ³	R ⁴	W	X ₁	Y _m	Z _n
1	CH ₃	H	H	H	O	3-F	4-OSO ₂ CF ₃	4-CF ₃
1	CH ₃	H	H	H	O	3-F	4-CN	4-OCF ₃
1	CH ₃	H	H	H	O	3-F	3,4-F ₂	4-Cl
1	CH ₃	H	H	H	O	3-CF ₃	4-CN	4-CF ₃
1	CH ₂ CH ₃	H	H	H	O	3-F	4-F	4-Cl
1	CH ₂ CH ₂ CH ₃	H	H	H	O	3-F	4-F	4-Br
1	CH ₂ CH ₂ CH ₂ CH ₃	H	H	H	O	3-F	4-F	4-CF ₃
1	CH(CH ₃) ₂	H	H	H	O	3-F	4-F	4-OCF ₃
1	C(CH ₃) ₃	H	H	H	O	3-F	4-F	4-OCHF ₂
1	CH ₂ CH=CH ₂	H	H	H	O	3-F	4-F	4-OCF ₂ Br
1	CH ₂ C≡CH	H	H	H	O	3-F	4-F	4-OCF ₂ CHF ₂
1	CH ₂ OCH ₃	H	H	H	O	3-F	4-F	4-OSO ₂ CF ₃
1	CH ₂ OCH ₂ CH ₃	H	H	H	O	H	4-F	4-OCF ₃
1	CH ₂ CH ₂ OCH ₃	H	H	H	O	4-F	4-F	4-Cl
1	CHF ₂	H	H	H	O	3-Cl	4-F	4-CF ₃
1	CBrF ₂	H	H	H	O	3-Br	4-F	4-OCF ₃
1	CF ₃	H	H	H	O	3-CF ₃	4-F	4-Cl
1	COCH ₃	H	H	H	O	3-OCF ₃	4-F	4-CF ₃
1	COCF ₃	H	H	H	O	3-OCHF ₂	4-F	4-OCF ₃
1	CO ₂ CH ₃	H	H	H	O	4-OCHF ₂	4-F	4-Cl
1	CH ₂ C ₆ H ₅	H	H	H	O	3-F	4-Cl	4-CF ₃
1	SC ₆ H ₅	H	H	H	O	3-F	4-Br	4-OCF ₃
1	SCCl ₃	H	H	H	O	3-F	4-CF ₃	4-Cl
1	SCO ₂ CH ₂ CH ₃	H	H	H	O	3-F	4-OSO ₂ CF ₃	4-CF ₃
1	S(C ₆ H ₄ -2-NO ₂)	H	H	H	O	3-F	4-CN	4-OCF ₃
1	SN(CH ₂ CH ₂ CH ₂ CH ₃) ₂	H	H	H	O	3-F	3,4-F ₂	4-Cl
1	SN(CH ₃)CO ₂ CH ₂ CH ₃	H	H	H	O	3-CF ₃	4-CN	4-CF ₃
2	H	H	H	H	O	3-F	4-F	4-Cl
2	H	H	H	H	O	3-F	4-F	4-Br
2	H	H	H	H	O	3-F	4-F	4-CF ₃
2	H	H	H	H	O	3-F	4-F	4-OCF ₃
2	H	H	H	H	O	3-F	4-F	4-OCHF ₂
2	H	H	H	H	O	3-F	4-F	4-OCF ₂ Br
2	H	H	H	H	O	3-F	4-F	4-OCF ₂ CHF ₂
2	H	H	H	H	O	3-F	4-F	4-OSO ₂ CF ₃
2	H	H	H	H	O	H	4-F	4-OCF ₃
2	H	H	H	H	O	4-F	4-F	4-Cl
2	H	H	H	H	O	3-Cl	4-F	4-CF ₃
2	H	H	H	H	O	3-Br	4-F	4-OCF ₃
2	H	H	H	H	O	3-CF ₃	4-F	4-Cl
2	H	H	H	H	O	3-OCF ₃	4-F	4-CF ₃
2	H	H	H	H	O	3-OCHF ₂	4-F	4-OCF ₃

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k	R ¹	R ²	R ³	R ⁴	W	X ₁	Y _m	Z _n
2	H	H	H	H	O	4-OCHF ₂	4-F	4-Cl
2	H	H	H	H	O	3-F	4-Cl	4-CF ₃
2	H	H	H	H	O	3-F	4-Br	4-OCF ₃
2	H	H	H	H	O	3-F	4-CF ₃	4-Cl
2	H	H	H	H	O	3-F	4-OSO ₂ CF ₃	4-CF ₃
2	H	H	H	H	O	3-F	4-CN	4-OCF ₃
2	H	H	H	H	O	3-F	3,4-F ₂	4-Cl
2	H	H	H	H	O	3-CF ₃	4-CN	4-CF ₃

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In the present invention, the pesticide means, in particular, an agent for controlling insect pests.

The compound of the present invention exhibits pesticidal effects against various insect pests at an extremely low dose. The insect pests include, for example, agricultural insect pests such as green rice leafhopper (Nephotettix cincticeps), brown rice planthopper (Nilaparvata lugens), green peach aphid (Myzus persicae), 28-spotted ladybird (Epilachna vigintioctopunctata), tobacco budworm (Heliothis virescens), european corn borer (Ostrinia nubilalis), fall armyworm (Spodoptera frugiperda), corn earworm (Helicoverpa zea), cabbage armyworm (Mamestra brassicae), common cutworm (Spodoptera litura), common white (Pieris rapae crucivora), cabbage sawfly (Athalia rosae ruficornis), smaller tea tortrix (Adoxophyes sp.), oriental tea tortrix (Homona magnanima), rice leafroller (Cnaphalocrocis medinalis), diamondback moth (Plutella xylostella), southern corn rootworm (Diabrotica undecimpunctata howardi), northern corn rootworm (D. longicornis barberi), western corn rootworm (D. virgifera virgifera), Colorado potato beetle (Leptinotarsa decemlineata); sanitary insect pests such as common gnat (Culex pipiens pallens), housefly, German cockroach (Blattella germanica), ants, fleas and louses; stored grain insect pests such as maize weevil (Sitophilus zeamais), red flour beetle (Tribolium castaneum) and

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almond moth (Cadra cautella); house pests such as Formosan subterranean termite (Coptotermes formosanus); animal pests such as mites, fleas and louses; indoor dust mites such as acarid mites (Acaridae), Dermatophagoides
5 farinae, and Chenyletus malaccensis; and mollusks such as slugs (Philomycidae) and snails. Namely, the compound of the present invention is capable of effectively controlling pests such as orthoptera, hemiptera, lepidoptera, coleoptera, hymenoptera, diptera, isoptera
10 and acarina at a low dose. On the other hand, the compound of the present invention has been found to be an extremely useful compound which is substantially free from adverse effects against mammals, fishes, Crustacea and beneficial insects. On the basis of this discovery,
15 the present invention has been accomplished.

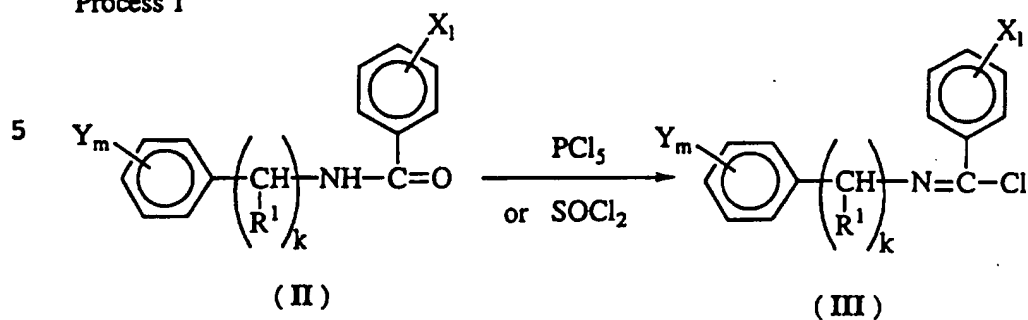
Now, methods for preparing the compounds of the present invention will be described. The compounds of the present invention are novel semicarbazone derivatives, and representative methods for their
20 production will be described specifically.

In the respective methods (methods A to F), W, X, Y, Z, R¹, R², R³, R⁴, k, *ℓ*, m and n are as defined above, and each of L¹, L² and L³ is an excellent leaving group such as a chlorine atom, a bromine atom, an iodine atom,
25 an alkylsulfonate group or an arylsulfonate group.

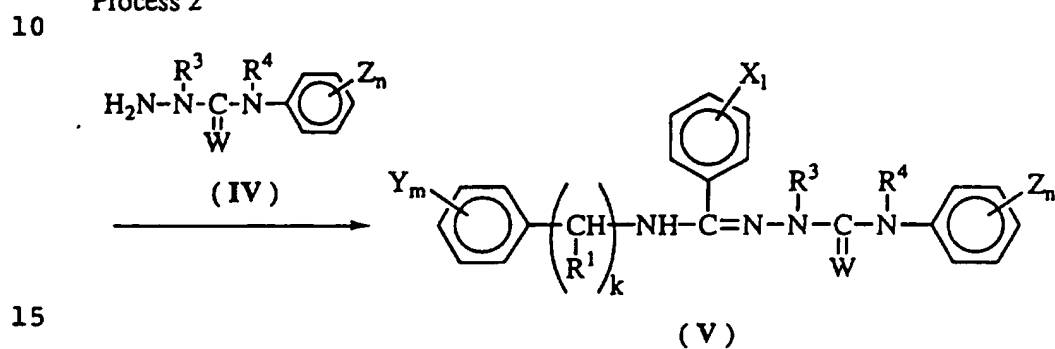
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Method A

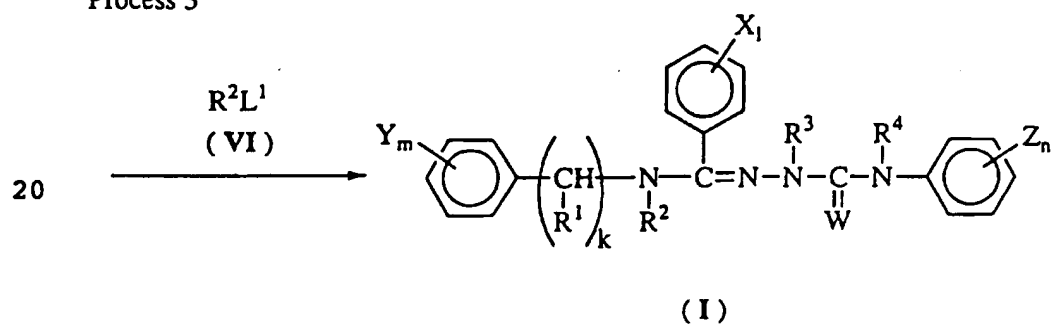
Process 1



Process 2



Process 3



A compound of the formula (III) can be obtained by
 25 reacting a compound of the formula (II) with phosphorus
 pentachloride in an inert solvent or without any solvent,
 or by reacting a compound of the formula (II) with

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thionyl chloride in an inert solvent or without any solvent. In the case of the reaction with thionyl chloride, the reaction proceeds more efficiently if dimethylformamide is added. Then, the compound of the formula (III) and a compound of the formula (IV) are reacted in the presence or absence of a base in an inert solvent to obtain a compound of the formula (V) of the present invention (a compound of the formula (I) wherein R^2 is a hydrogen atom). Further, a compound of the formula (I) of the present invention can be obtained by reacting the compound of the formula (V) of the present invention and a compound of the formula (VI) in the presence of a base in an inert solvent.

The solvent to be used in Process 1 may, for example, be an aromatic hydrocarbon such as benzene or toluene, or a halogenated hydrocarbon such as carbon tetrachloride or 1,1,2-trichloroethane. It is preferred to employ an excess amount of phosphorus pentachloride in toluene. The reaction temperature can be set at an optional level within a range of from 0°C to the reflux temperature of the reaction mixture. However, it is preferred to conduct the reaction at a temperature of from 60°C to the reflux temperature.

The base to be used in Process 2 may, for example, be an alkali metal alkoxide such as sodium ethoxide or potassium tert-butoxide, an alkali metal hydroxide such as sodium hydroxide or potassium hydroxide, an alkali

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metal carbonate such as sodium carbonate, potassium carbonate or sodium hydrogen carbonate, an alkali metal hydride such as sodium hydride or potassium hydride, or an organic base such as triethylamine or pyridine. The solvent to be used may be any solvent so long as it does not hinder the reaction. For example, a lower alcohol such as methanol or ethanol, an aromatic hydrocarbon such as benzene or toluene, an ether such as diethyl ether, 1,2-dimethoxyethane, tetrahydrofuran or 1,4-dioxane, a halogenated hydrocarbon such as dichloromethane or 1,2-dichloroethane, an amide such as dimethylformamide or dimethylacetamide, acetonitrile, dimethylsulfoxide, or water, may be mentioned. These inert solvents may be used alone or in combination as a mixture. Usually, it is preferred to use as the base, an organic base such as triethylamine or pyridine and as a solvent an aromatic hydrocarbon such as benzene or toluene, or an ether such as tetrahydrofuran or diethyl ether. The reaction temperature may be set at an optional level within a range of from -60°C to the reflux temperature of the reaction mixture. However, it is preferred to conduct the reaction within a range of from 0°C to reflux temperature of the reaction mixture.

The base to be used in Process 3 may, for example, be an alkali metal alkoxide such as sodium ethoxide or potassium tert-butoxide, an alkali metal hydroxide such as sodium hydroxide or potassium hydroxide, an alkali

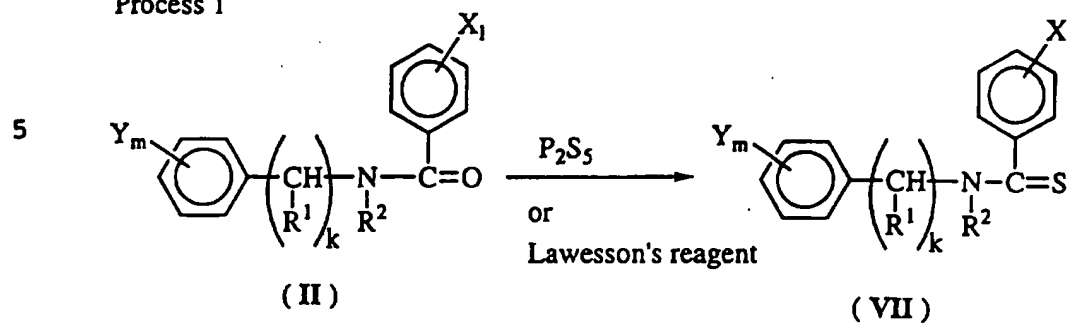
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metal carbonate such as sodium carbonate, potassium carbonate or sodium hydrogen carbonate, an alkali metal hydride such as sodium hydride or potassium hydride, or an organic base such as triethylamine or pyridine. The solvent to be used may be any solvent so long as it does not hinder the reaction. For example, it may be a lower alcohol such as methanol or ethanol, an aromatic hydrocarbon such as benzene or toluene, an ether such as diethyl ether, 1,2-dimethoxyethane, tetrahydrofuran or 1,4-dioxane, a halogenated hydrocarbon such as dichloromethane or 1,2-dichloroethane, an amide such as dimethylformamide or dimethylacetamide, acetonitrile, dimethylsulfoxide, or water. Such inert solvents may be used alone or in combination as a mixture. Usually, it is preferred to employ as the base sodium hydride, potassium hydride, potassium tert-butoxide, or potassium hydroxide in a polar solvent such as tetrahydrofuran or dimethylformamide. The reaction temperature can be set at an optional level within a range of from -60°C to the reflux temperature of the reaction mixture. However, it is preferred to conduct the reaction at a temperature of from 0°C to 90°C.

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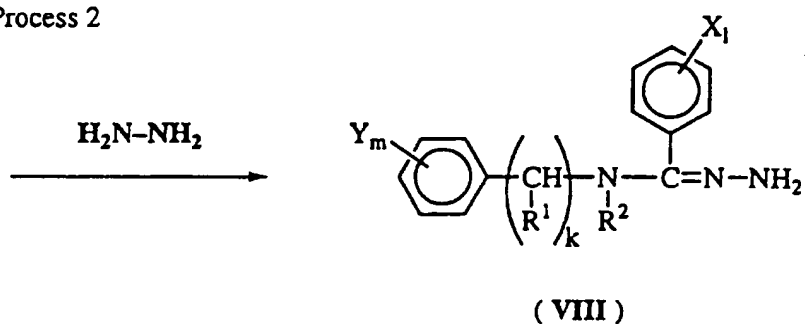
Method B

Process 1



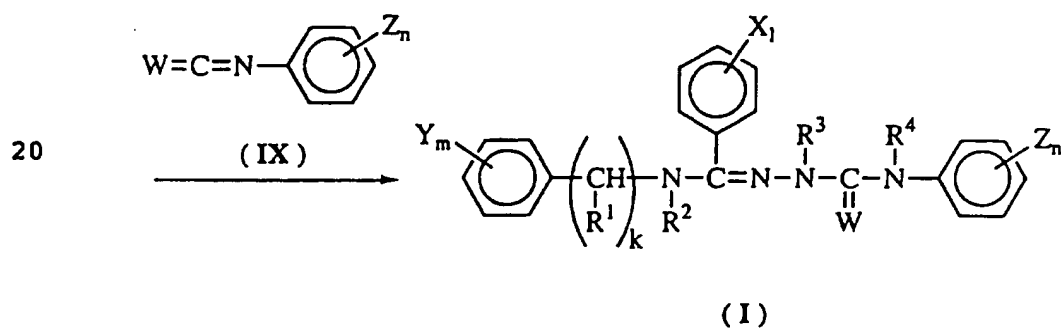
10

Process 2



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Process 3



25 A compound of the formula (VII) can be obtained by reacting a compound of the formula (II) and diphosphorus pentasulfide in an inert solvent or without solvent, or

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by reacting a compound of the formula (II) with a Lawesson's reagent in an inert solvent or without solvent. Then, the compound of the formula (VII) and hydrazine are reacted in the presence or absence of a base in an inert solvent or without solvent, to obtain a compound of the formula (VIII). Further, the compound of the formula (VIII) and a compound of the formula (IX) are reacted in an inert solvent in the presence or absence of a base to obtain a compound of the formula (I) of the present invention. The compound of the formula (VIII) can also be obtained by reacting hydrazine to the compound of the formula (III) obtained in Process 1 of Method A.

The solvent to be used in Process 1 may be any solvent so long as it does not hinder the reaction. For example, it may be an aromatic hydrocarbon such as benzene or toluene, an ether such as diethyl ether, 1,2-dimethoxyethane, tetrahydrofuran or 1,4-dioxane, a halogenated hydrocarbon such as dichloromethane or 1,2-dichloroethane, an amide such as dimethylformamide or dimethylacetamide, acetonitrile, pyridine, dimethylsulfoxide, or water. These inert solvents may be used alone or in combination as a mixture. Usually, it is preferred to employ a slightly excess amount of diphosphorus sulfide in pyridine. The reaction temperature can be set at an optional level within a range of from 0°C to the reflux temperature of the

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reaction mixture. However, it is preferred to conduct the reaction at a temperature of from 60°C to the reflux temperature.

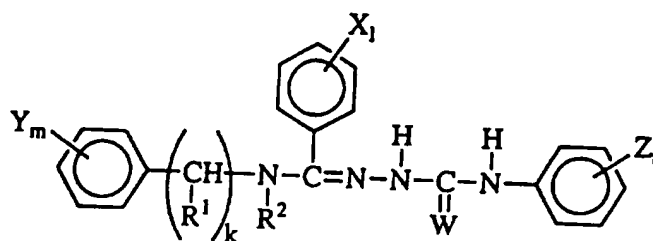
The base to be used in Process 3 may, for example, be
5 an alkali metal alkoxide such as sodium ethoxide or potassium tert-butoxide, an alkali metal hydroxide such as sodium hydroxide or potassium hydroxide, an alkali metal carbonate such as sodium carbonate, potassium carbonate or sodium hydrogen carbonate, an alkali metal
10 hydride such as sodium hydride or potassium hydride, or an organic base such as triethylamine or pyridine. The solvent to be used may be any solvent so long as it does not hinder the reaction. For example, it may be a lower alcohol such as methanol or ethanol, an aromatic
15 hydrocarbon such as benzene or toluene, an ether such as diethyl ether, 1,2-dimethoxyethane, tetrahydrofuran or 1,4-dioxane, a halogenated hydrocarbon such as dichloromethane or 1,2-dichloroethane, an amide such as dimethylformamide or dimethylacetamide, acetonitrile,
20 dimethylsulfoxide, or water. These inert solvents may be used alone or in combination as a mixture. Usually, it is preferred to employ as the base an organic base such as triethylamine or pyridine and as the solvent a halogenated hydrocarbon such as dichloromethane. The
25 reaction temperature can be set at an optional level within a range of from 0°C to the reflux temperature of the reaction mixture. However, it is preferred to

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conduct the reaction at a temperature of from 0°C to 50°C.

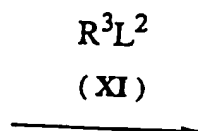
Method C

5

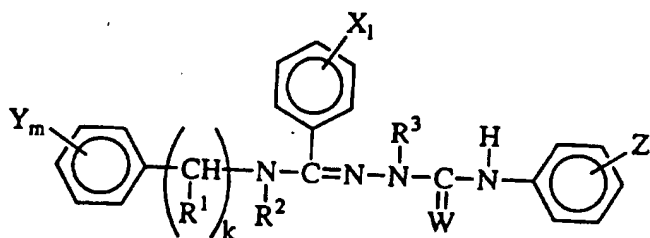


(X)

10

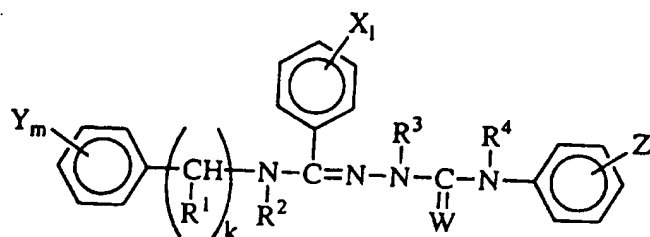
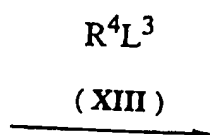


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(XII)

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(I)

25

This method is a method of introducing R^3 and R^4 into a compound of the formula (I) of the present invention

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wherein $R^3 = R^4 =$ hydrogen atom. A compound of the formula (XII) of the present invention can be obtained by reacting a compound of the formula (X) of the present invention and a compound of the formula (XI) in the presence of a base in an inert solvent. Then, the compound of the formula (XII) of the present invention and a compound of the formula (XIII) is reacted in the presence of a base in an inert solvent to obtain a compound of the formula (I) of the present invention.

10 The base to be used in this reaction may, for example, be an alkali metal alkoxide such as sodium ethoxide, potassium tert-butoxide, an alkali metal hydroxide such as sodium hydroxide or potassium hydroxide, an alkali metal carbonate such as sodium carbonate, potassium

15 carbonate or sodium hydrogen carbonate, an alkali metal hydride such as sodium hydride or potassium hydride, or an organic base such as triethylamine or pyridine. The solvent to be used may be any solvent so long as it does not hinder the reaction. For example, it may be a lower

20 alcohol such as methanol or ethanol, an aromatic hydrocarbon such as benzene or toluene, an ether such as diethyl ether, 1,2-dimethoxyethane, tetrahydrofuran or 1,4-dioxane, a halogenated hydrocarbon such as dichloromethane or 1,2-dichloroethane, an amide such as

25 dimethylformamide or dimethylacetamide, acetonitrile, dimethylsulfoxide, or water. These inert solvents may be used alone or in combination as a mixture. Usually, it

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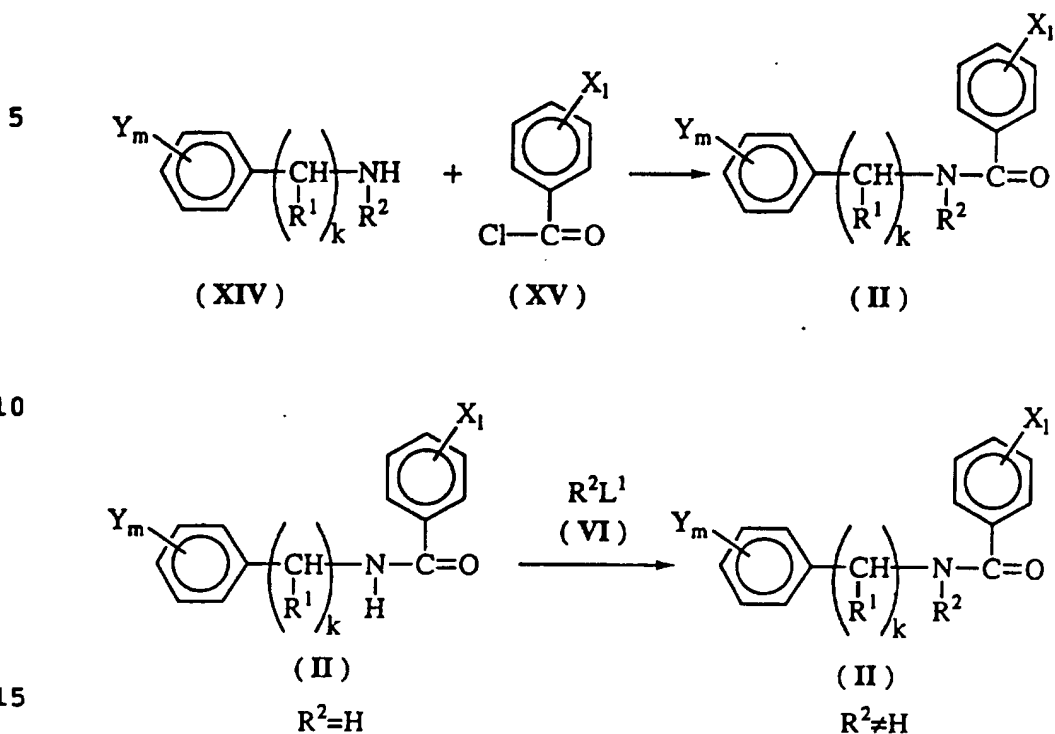
is preferred to employ as the base sodium hydride, potassium hydride, potassium tert-butoxide or potassium hydroxide in a polar solvent such as tetrahydrofuran or dimethylformamide. The reaction temperature can be set
5 at an optional level within a range of from -60°C to the reflux temperature of the reaction mixture. However, it is preferred to conduct the reaction at a temperature of from 0°C to 90°C. In this reaction, in the case where $R^3 = R^4$, a compound of the formula (I) of the present
10 invention can be obtained without isolating the compound of the formula (VII) by using two equivalents of the compound of the formula (XI) and two equivalents of a base.

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Method D

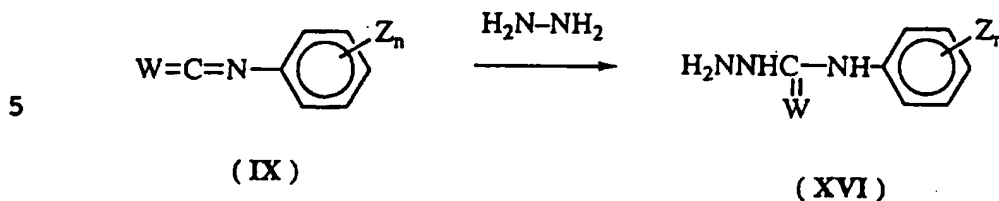
A compound of the formula (II) as starting material
 20 can be obtained by reacting a compound of the formula
 (XIV) and a compound of the formula (XV) in the presence
 of a base in an inert solvent. The base to be used in
 this method may, for example, be an alkali metal
 carbonate such as sodium carbonate, potassium carbonate
 25 or sodium hydrogen carbonate, an alkali metal hydride
 such as sodium hydride or potassium hydride, or an
 organic base such as triethylamine or pyridine. The

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solvent to be used may be any solvent so long as it does not hinder the reaction. For example, it may be an aromatic hydrocarbon such as benzene or toluene, an ether such as diethyl ether, 1,2-dimethoxyethane, 5 tetrahydrofuran or 1,4-dioxane, a halogenated hydrocarbon such as dichloromethane or 1,2-dichloroethane, an amide such as dimethylformamide or dimethylacetamide, acetonitrile, dimethylsulfoxide, or water. These inert solvents may be used alone or in combination as a 10 mixture. Usually, it is preferred to employ an organic base such as triethylamine or pyridine and as a solvent, an aromatic hydrocarbon such as benzene or toluene, or an ether such as tetrahydrofuran or diethyl ether. The reaction temperature may be set at an optional level 15 within a range of from -60°C to the reflux temperature of the reaction mixture. However, it is preferred to conduct the reaction at a temperature of from 0°C to 120°C.

In the case of the compound of the formula (II) 20 wherein $R^2 = H$, a compound of the formula (II) wherein $R^2 \neq H$ can be obtained by reacting a compound of the formula (VI) in the presence of a base in an inert solvent.

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Method E

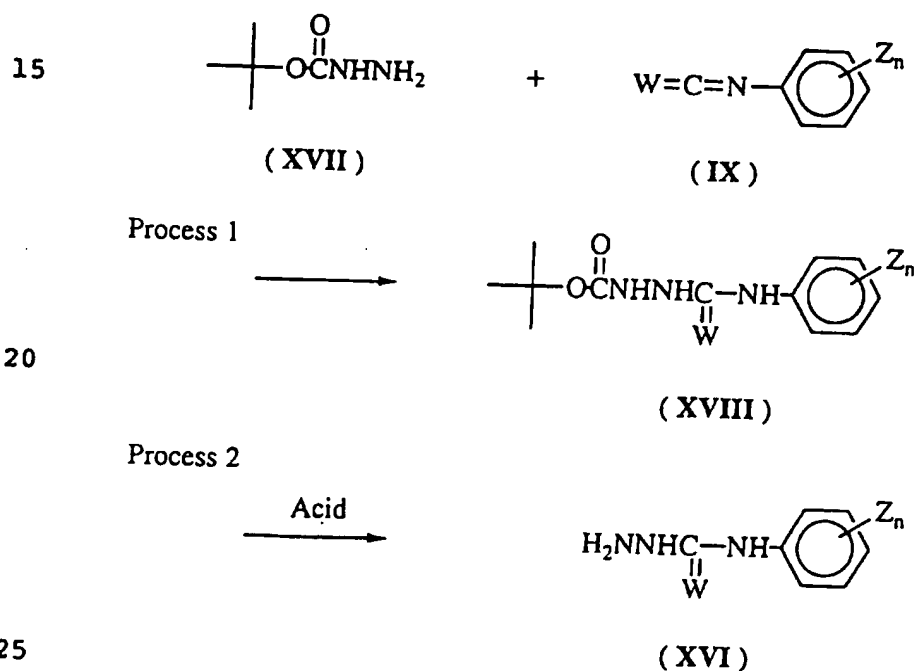
This method is directed to a synthesis of a starting
 10 material where $\text{R}^3 = \text{R}^4 = \text{hydrogen atom}$ (a compound of the
 formula (IV) wherein $\text{R}^3 = \text{R}^4 = \text{hydrogen}$). A compound of
 the formula (XVI) can be obtained by reacting a compound
 of the formula (IX) and hydrazine in the presence or
 absence of a catalyst in an inert solvent. The catalyst
 15 to be used in this reaction may, for example, be an
 organic base such as triethylenediamine or
 diazabicycloundecene. The amount of the catalyst to be
 used can be set at an optional level within a range of
 from 0.001 wt% to 10 wt%, relative to the compound of the
 20 formula (IX). However, an amount of from 0.1wt% to 1 wt%
 is preferred. The solvent may be any solvent so long as
 it does not hinder the reaction. For example, it may be
 an aromatic hydrocarbon such as benzene or toluene, an
 ether such as diethyl ether or tetrahydrofuran, a
 25 halogenated hydrocarbon such as dichloromethane or
 chloroform, an amide such as dimethylformamide or
 dimethylacetamide, acetonitrile, dimethylsulfoxide, or

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water. These inert solvents may be used alone or in combination as a mixture. The reaction temperature can be set at an optional level within a range of from -60°C to the reflux temperature of the reaction mixture.

- 5 However, it is preferred to conduct the reaction at a temperature of from 0°C to 50°C . In this reaction, the molar ratio of the reactants is not particularly limited. However, in order to obtain the compound of the formula (XVI) in good yield, it is preferred to employ hydrazine
 10 in a slightly excess amount relative to the compound of the formula (IX).

Method F



This method is an alternative method of Method E and

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directed to a synthesis of a starting material where R^3
= R^4 = hydrogen atom (a compound of the formula (IV)
wherein R^3 = R^4 = hydrogen atom). A compound of the
formula (XVIII) can be obtained by reacting a compound of
5 the formula (XVII) and a compound of the formula (IX) in
the presence or absence of a catalyst in an inert
solvent. The catalyst, the solvent and the reaction
conditions such as the temperature to be used in this
reaction may be similar to those in Method E. It is a
10 feature of this method that the compound of the formula
(XVIII) can be obtained in good yield by using equimolar
amounts of the compound of the formula (XVII) and the
compound of the formula (IX). In Process 2, the compound
of the formula (XVIII) is reacted in the presence of an
15 acid in an inert solvent to obtain a compound of the
formula (XIX). The acid to be used may, for example, be
an inorganic acid such as hydrochloric acid or sulfuric
acid, or an organic acid such as paratoluenesulfonic acid
or trifluoroacetic acid. The solvent may be any solvent
20 so long as it does not hinder the reaction. For example,
it may be a lower alcohol such as methanol or ethanol, an
aromatic hydrocarbon such as benzene or toluene, an ether
such as diethyl ether or tetrahydrofuran, a halogenated
hydrocarbon such as dichloromethane or carbon
25 tetrachloride, an amide such as dimethylformamide or
dimethylacetamide, acetonitrile, dimethylsulfoxide,
acetic acid, or water. These inert solvents may be used

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alone or in combination as a mixture. Usually, it is preferred to employ an excess amount of hydrochloric acid in a lower alcohol such as methanol or ethanol. The reaction temperature can be set at an optional level
5 within a range of from -60°C to the reflux temperature of the reaction mixture. However, it is preferred to conduct the reaction at a temperature of from 0°C to the reflux temperature of the reaction mixture.

In the respective methods, the molar ratios of the
10 respective reactants are not particularly limited. However, it is advantageous to conduct the reactions in equimolar or close to equimolar amounts.

When it is necessary to purify the compound of the present invention, the compound can be separated and
15 purified by an optional purification method such as recrystallization, column chromatography or thin layer chromatography.

When the compound of the present invention is to be used as a pesticide, it is usually applied as admixed
20 with a suitable carrier, for example, a solid carrier such as clay, pulp, bentonite, diatomaceous earth or fine silica powder, or a liquid carrier such as water, an alcohol (such as isopropanol, butanol, benzyl alcohol or furfuryl alcohol), an aromatic hydrocarbon (such as
25 toluene or xylene), an ether (such as anisol), a ketone (such as cyclohexanone or isophorone), an ester (such as butyl acetate), an acid amide (such as N-

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methypyrrolidone) or a halogenated hydrocarbon (such as chlorobenzene). If desired, a surfactant, an emulsifier, a dispersant, a penetrating agent, an extender, a thickener, an anti-freezing agent, an anti-solidification agent and/or a stabilizer may be added. It may be practically used in the form of an optional formulation such as a liquid formulation, an emulsifiable concentrate, a wettable powder, a dry flowable, a flowable, a dust or a granule.

Further, at the time of formulation or application, the compound of the present invention may be mixed with various other herbicides, insecticides, miticides, nematocides, fungicides, plant growth regulating agents, synergists, fertilizers or soil improving agents, as the case requires.

Particularly by mixing it with other agricultural chemicals or plant hormones, it can be expected to reduce the cost by a reduction of the dose in its application, to broaden the insecticidal spectrum due to synergistic effects of the mixed agents or to obtain higher pesticidal effects. In such a case, it is possible to combine it with a plurality of known agricultural chemicals. Compounds disclosed in 1994 Issue of Farm Chemicals Handbook may, for example, be mentioned as types of agricultural chemicals which can be used in admixture with the compound of the present invention.

The dose in application of the compound of the

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present invention varies depending upon the application site, the application season the manner of application and the type of the crop plant. However, it is usually in an amount of from 0.005 to 50 kg/ha as the amount of active ingredient.

Now, Formulation Examples will be given in which compounds of the present invention are used. However, it should be understood that the present invention is by no means restricted to such specific Formulation Examples.

In the following Formulation Examples, "parts" means "parts by weight".

Wettable powder

	Compound of the present invention	5 to 80 parts
	Solid carrier	10 to 85 parts
15	Surfactant	1 to 10 parts
	Others	1 to 5 parts

As "others" an antisolidification agent may, for example, be mentioned.

Emulsifiable concentrate

20	Compound of the present invention	1 to 30 parts
	Liquid carrier	30 to 95 parts
	Surfactant	5 to 15 parts

Flowable

	Compound of the present invention	5 to 70 parts
25	Liquid carrier	15 to 65 parts
	Surfactant	5 to 12 parts
	Others	5 to 30 parts

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As "others" an antifreezing agent and a thickener may, for example, be mentioned.

Dry flowable

	Compound of the present invention	20 to 90 parts
5	Solid carrier	10 to 60 parts
	Surfactant	1 to 20 parts

Granule

	Compound of the present invention	0.1 to 10 parts
	Solid carrier	90 to 99.99 parts
10	Others	1 to 5 parts

Dust

	Compound of the present invention	0.01 to 30 parts
	Solid carrier	67 to 99.5 parts
	Others	0 to 3 parts

15 Now, the present invention will be described in further detail with reference to Examples (Preparation Examples, Formulation Examples and Test Examples).

PREPARATION EXAMPLES

The compounds of the present invention were prepared
20 or can be prepared in accordance with the following Preparation Examples. However, it should be understood that the present invention is by no means restricted by such specific Preparation Examples.

PREPARATION EXAMPLE 1

25 N-(4-chlorophenyl)-4-chlorobenzamide-4-trifluoromethoxyphenylsemicarbazone (Compound No. 1 of the present invention)

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1.0 g of N-(4-chlorophenyl)-4-chlorobenzamide and 1.2 g of phosphorus pentachloride were gradually heated and dissolved and then stirred under reflux for 3 hours. Then, phosphorus oxychloride formed as a by-product was
5 distilled off under reduced pressure. The residue and 1.00 g of N-(4-trifluoromethoxyphenyl)hydrazine carboxamide were dissolved in a solvent mixture composed of 20 ml of benzene and 20 ml of tetrahydrofuran, and 0.50 g of triethylamine was dropwise added thereto with
10 stirring at room temperature. The mixture was further stirred at room temperature for 3 hours. The reaction mixture was poured into 200 ml of ice water and then extracted by an addition of 100 ml of ethyl acetate. The organic layer was washed with water and dried over
15 anhydrous sodium sulfate. Then, the solvent was distilled off under reduced pressure to obtain 2.05 g of a crude product. The crude product was purified by thin layer chromatography and further recrystallized from isopropyl ether to obtain 0.38 g of the desired product.
20 Melting point: 206.5-208.0°C
¹H-NMR(CDCl₃+DMSO-d₆) δ ppm: 6.50-7.65(12H, m), 8.08(1H, s), 8.41(1H, s), 9.51(1H, s).

REFERENCE EXAMPLE 1

N-(4-chlorophenyl)-4-chlorobenzamide

25 3.3 g of 4-chloroaniline and 3.3 g of triethylamine were dissolved in 50 ml of benzene, and 20 ml of a benzene solution of 5.3 g of 4-chlorobenzoyl chloride was

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dropwise added thereto with stirring under cooling with ice. Then, the mixture was further stirred at room temperature for one hour. The reaction mixture was poured into 200 ml of ice water and then extracted with 5 200 ml of ethyl acetate. The organic layer was washed with 1N hydrochloric acid and then with a saturated sodium chloride aqueous solution and then dried over anhydrous sodium sulfate. Then, the solvent was distilled off under reduced pressure to obtain 6.33 g of 10 N-(4-chlorophenyl)-4-chlorobenzamide.

PREPARATION EXAMPLE 2

N-(4-cyanophenyl)-N-methyl-3-fluorobenzamide 4-trifluoromethoxyphenylsemicarbazone (Compound No. 93 of the present invention)

15 0.54 g of N-(4-cyanophenyl)-N-methyl-3-fluorobenzamidrazone, 0.41 g of 4-trifluoromethoxyphenyl isocyanate and two drops of triethylamine were added to 10 ml of dichloromethane and stirred at room temperature for 3 days. Then, 100 ml of ethyl acetate was added 20 thereto, and the mixture was washed twice with water. Then, the solvent was distilled off under reduced pressure. The residue was washed with isopropyl ether to obtain 0.57 g of the desired compound.

Melting point: 210.0-213.0°C

25 REFERENCE EXAMPLE 2

N-(4-cyanophenyl)-3-fluorobenzamide

31.01 g of 4-aminobenzonitrile and 30.36 g of

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triethylamine were dissolved in 950 ml of benzene, and 50 ml of a benzene solution of 39.64 g of 3-fluorobenzoyl chloride was dropwise added thereto with stirring under cooling with ice. After completion of the dropwise addition, the mixture was stirred at room temperature overnight, and then the solvent was distilled off under reduced pressure. The residue was dissolved in 500 ml of ethyl acetate, washed twice with water and then dried over anhydrous sodium sulfate. Then, the solvent was distilled off under reduced pressure. The residue was washed with diisopropyl ether to obtain 55.92 g of the desired compound.

Melting point: 148.6-150.3°C

N-(4-cyanophenyl)-N-methyl-3-fluorobenzamide

0.52 g of sodium hydride (purity: 55%) was added to 10 ml of dimethylformamide, and 2.40 g of N-(4-cyanophenyl)-3-fluorobenzamide was added thereto with stirring under cooling ice. The mixture was stirred at room temperature for one hour, and then 2.13 g of methyl iodide was added thereto. The mixture was further stirred at room temperature overnight. Then, 150 ml of diethyl ether was added thereto, and the mixture was washed twice with a saturated sodium chloride aqueous solution and then dried over anhydrous sodium sulfate. Then, the solvent was distilled off under reduced pressure. The residue was recrystallized from diisopropyl ether to obtain 1.87 g of the desired

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compound.

Melting point: 103.2-106.1°C

N-(4-cyanophenyl)-N-methyl-3-fluorobenzenecarbothioamide

1.87 g of N-(4-cyanophenyl)-N-methyl-3-
5 fluorobenzamide and 1.80 g of diphosphorus pentasulfide
were added to 10 ml of pyridine, and the mixture was
stirred for 2 hours under reflux under heating. Then,
the mixture was poured into 100 ml of ice water. The
mixture was turned into alkaline with an aqueous
10 potassium hydroxide solution and then extracted by an
addition of 150 ml of ethyl acetate. The organic layer
was washed twice with dilute hydrochloric acid and then
dried over anhydrous sodium sulfate. Then, the solvent
was distilled off under reduced pressure. The residue
15 was purified by silica gel column chromatography
(developer: chloroform) to obtain 1.99 g of the desired
compound as an oily substance.

¹H-NMR(CDCl₃): δ ppm 3.9(s, 3H), 6.8-7.6(m, 8H).

N-(4-cyanophenyl)-N-methyl-3-fluorobenzamidrazone

20 1.99 g of N-(4-cyanophenyl)-N-methyl 3-
fluorobenzenecarbothioamide and 1.85 g of hydrazine
monohydrate were added to 40 ml of ethanol, and the
mixture was stirred for 3 hours under reflux under
heating. Then, 100 ml of water was added thereto, and
25 ethanol was distilled off under reduced pressure. The
residue was extracted by an addition of 150 ml of ethyl
acetate, and the organic layer was washed twice with

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water and then dried over anhydrous sodium sulfate.
Then, the solvent was distilled off under reduced
pressure. The residue was purified by silica gel column
chromatography (developer: hexane/ethyl acetate = 1/1) to
5 obtain 1.27 g of the desired compound.

Melting point: 129.5-131.0°C

PREPARATION EXAMPLE 3

N-(4-cyanophenyl)-N-methyl-3-fluorobenzamide 4-(4-
trifluoromethoxyphenyl)-2-methylsemicarbazone (Compound
10 No. 102 of the present invention)

0.2 g of sodium hydride (purity: 55%) was added to 5
ml of dimethylformamide, and a solution of 1.0 g of N-(4-
cyanophenyl)-N-methyl-3-fluorobenzamide 4-
trifluoromethoxyphenylsemicarbazone and 10 ml of
15 dimethylformamide, was dropwise added thereto with
stirring under cooling with ice. The mixture was stirred
at room temperature for 30 minutes, and a solution of
0.36 g of methyl iodide and 3 ml of dimethylformamide,
was added thereto. The mixture was further stirred at
20 room temperature for 3 hours. The reaction mixture was
poured into ice water, and formed crystals were collected
by filtration and washed with water and hexane and then
dried. The crystals were recrystallized from ethyl
acetate/hexane to obtain 0.14 g of the desired compound.
25 Melting point: 209.0-210.0°C

REFERENCE EXAMPLE 3

N-(4-cyanophenyl)-3-fluorobenzenecarbothioamide

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9.61 g of N-(4-cyanophenyl)-3-fluorobenzamide and 9.34 g of diphosphorus pentasulfide were added to 40 ml of pyridine, and the mixture was stirred for 2 hours under reflux under heating and then poured into 400 ml of ice water. The mixture was turned into alkaline with an aqueous potassium hydroxide solution, and precipitated solid was collected by filtration, dried and then washed with diisopropyl ether to obtain 8.17 g of the desired compound.

10 N-(4-cyanophenyl)-3-fluorobenzamidrazone

7.69 g of N-(4-cyanophenyl)-3-fluorobenzenecarbothioamide and 7.51 g of hydrazine monohydrate were added to 150 ml of ethanol, and the mixture was stirred for 2 hours under reflux under heating. Then, 150 ml of water was added thereto, and ethanol was distilled off under reduced pressure. The residue was extracted by an addition of 300 ml of ethyl acetate, and the organic layer was washed twice with water and then dried over anhydrous sodium sulfate. Then, the solvent was distilled off under reduced pressure. The residue was washed with diisopropyl ether to obtain 5.33 g of the desired compound.

Melting point: 104.0-105.0°C

N-(4-cyanophenyl)-3-fluorobenzamidrazone

25 9.61 g of N-(4-cyanophenyl)-3-fluorobenzamide and 9.16 g of phosphorus pentachloride were added to 40 ml of toluene, and the mixture was stirred for 2 hours under

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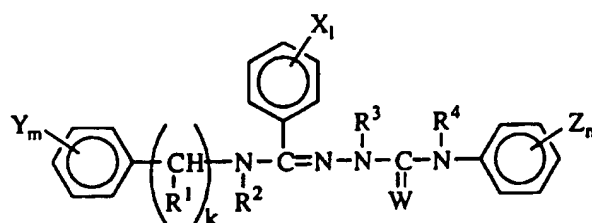
- reflux under heating. Then, the solvent was distilled off under reduced pressure. The residue was dissolved in 50 ml of benzene, and the solution was dropwise added to 50 ml of a benzene solution of 6.01 g of hydrazine monohydrate with stirring at room temperature. The mixture was stirred at room temperature overnight, and then 100 ml of water was added thereto. Benzene was distilled off under reduced pressure. The residue was extracted by an addition of 400 ml of ethyl acetate, and the organic layer was washed twice with water and then dried over anhydrous sodium sulfate. The solvent was distilled off under reduced pressure. The residue was washed with diisopropyl ether to obtain 4.88 g of the desired compound.
- 15 In accordance with the above Preparation Examples, compounds identified in Table 2 were prepared.

20

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Table 2



(I)

No.	k	R ¹	R ²	R ³	R ⁴	W	X ₁	Y _m	Z _n	melting point (°C)
1	0		H	H	H	O	4-Cl	4-Cl	4-OCF ₃	206.5-208.0
2	1	H	H	H	H	O	4-Cl	4-Cl	4-OCF ₃	185.0-187.0
3	0		H	H	H	O	3-Cl	4-F	4-OCF ₃	182.0-183.0
4	0		H	H	H	O	3-Cl	4-CN	4-OCF ₃	198.0-200.0
5	0		H	H	H	O	3-F	4-CN	4-OCF ₃	193.0-195.5
6	1	H	H	H	H	O	3-CF ₃	4-F	4-OCF ₃	166.0-167.0
7	0		H	H	H	O	4-CF ₃	4-F	4-OCF ₃	183.0-185.5
8	1	H	H	H	H	O	3-CF ₃	4-F	4-OCF ₃	166.0-167.0
9	0		H	H	H	O	3-CF ₃	4-CN	4-OCF ₃	210.0-212.5
10	0		H	H	H	O	3-CF ₃	4-CF ₃	4-OCF ₃	162.0-163.0
11	0		H	H	H	O	3-OCF ₃	4-CN	4-OCF ₃	199.5-202.5
12	0		H	H	H	O	H	H	4-OCF ₃	160.0-163.0
13	0		H	H	H	O	3-F	H	4-OCF ₃	243.0-246.0
14	0		H	H	H	O	3-Cl	H	4-OCF ₃	186.0-187.0
15	0		H	H	H	O	3-Br	H	4-OCF ₃	180.0-183.0
16	0		H	H	H	O	3-CF ₃	H	4-OCF ₃	157.0-160.0
17	0		H	H	H	O	3-OCF ₂ H	H	4-OCF ₃	147.0-149.0
18	0		H	H	H	O	3-CN	H	4-OCF ₃	187.0-188.9
19	0		H	H	H	O	3-NO ₂	H	4-OCF ₃	185.8-186.9
20	0		H	H	H	O	3-CH ₃	H	4-OCF ₃	176.0-177.3
21	0		H	H	H	O	H	4-F	4-OCF ₃	177.0-178.0
22	0		H	H	H	O	H	4-Cl	4-OCF ₃	173.0-175.0
23	0		H	H	H	O	H	4-Br	4-OCF ₃	153.0-155.0
24	0		H	H	H	O	H	4-I	4-OCF ₃	172.0-175.0
25	0		H	H	H	O	H	4-t-C ₄ H ₉	4-OCF ₃	200.0-203.0
26	0		H	H	H	O	H	4-CF ₃	4-OCF ₃	195.0-197.0
27	0		H	H	H	O	H	4-OCF ₂ H	4-OCF ₃	173.0-174.0
28	0		H	H	H	O	H	4-OCF ₃	4-OCF ₃	189.0-190.0
29	0		H	H	H	O	H	4-OCF ₂ CF ₂ H	4-OCF ₃	179.5-181.7
30	0		H	H	H	O	H	4-OCH ₃	4-OCF ₃	182.0-183.0
31	0		H	H	H	O	H	4-OSO ₂ CH ₃	4-OCF ₃	234.5-238.5

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No.	k	R ¹	R ²	R ³	R ⁴	W	X ₁	Y _m	Z _n	melting point (°C)
32	0		H	H	H	O	H	4-CO ₂ CH ₂ CH ₃	4-OCF ₃	202.0-204.0
33	0		H	H	H	O	H	4-CN	4-OCF ₃	175.5-177.5
34	0		H	H	H	O	H	4-NO ₂	4-OCF ₃	178.0-180.5
35	0		H	H	H	O	H	3-CN	4-OCF ₃	250.0-251.0
36	0		H	H	H	O	3-F	4-Cl	4-OCF ₃	205.0-206.8
37	0		H	H	H	O	3-F	4-t-C ₄ H ₉	4-OCF ₃	182.0-185.0
38	0		H	H	H	O	3-F	4-CF ₃	4-OCF ₃	181.7-183.9
39	0		H	H	H	O	3-F	4-OCF ₂ H	4-OCF ₃	171.0-172.0
40	0		H	H	H	O	3-F	4-OCF ₃	4-OCF ₃	175.0-176.0
41	0		H	H	H	O	3-F	4-OCF ₂ CF ₂ H	4-OCF ₃	167.9-170.0
42	0		H	H	H	O	3-F	4-SCF ₃	4-OCF ₃	180.0-181.0
43	0		H	H	H	O	3-F	4-CO ₂ CH ₂ CH ₃	4-OCF ₃	186.5-188.0
44	0		H	H	H	O	3-F	4-NO ₂	4-OCF ₃	200.2-202.4
45	0		H	H	H	O	4-F	4-CN	4-OCF ₃	250.0-251.0
46	0		H	H	H	O	4-F	4-NO ₂	4-OCF ₃	181.0-185.0
47	0		H	H	H	O	3-F	3-Cl-4-CN	4-OCF ₃	193.7-195.9
48	0		H	H	H	O	3-Cl	4-CF ₃	4-OCF ₃	175.0-178.0
49	0		H	H	H	O	3-Cl	4-OCF ₂ H	4-OCF ₃	161.0-163.0
50	0		H	H	H	O	3-Cl	4-OCF ₃	4-OCF ₃	165.0-167.0
51	0		H	H	H	O	3-Cl	4-OCF ₂ CF ₂ H	4-OCF ₃	175.9-177.1
52	0		H	H	H	O	3-Cl	4-CO ₂ CH ₂ CH ₃	4-OCF ₃	179.0-181.0
53	0		H	H	H	O	3-Cl	4-NO ₂	4-OCF ₃	198.0-199.0
54	0		H	H	H	O	4-Cl	4-CN	4-OCF ₃	193.0-197.0
55	0		H	H	H	O	3-Br	4-CF ₃	4-OCF ₃	184.0-185.0
56	0		H	H	H	O	3-Br	4-CN	4-OCF ₃	233.8-236.8
57	0		H	H	H	O	3-CF ₃	4-Cl	4-OCF ₃	174.0-175.0
58	0		H	H	H	O	3-CF ₃	4-NO ₂	4-OCF ₃	188.0-191.0
59	0		H	H	H	O	3-OCF ₂ H	4-CF ₃	4-OCF ₃	155.9-158.0
60	0		H	H	H	O	3-OCF ₂ H	4-CN	4-OCF ₃	169.1-170.4
61	0		H	H	H	O	3-OCF ₂ H	4-NO ₂	4-OCF ₃	170.6-173.2
62	0		H	H	H	O	3-OCF ₃	4-CF ₃	4-OCF ₃	158.2-159.1
63	0		H	H	H	O	3-CH ₃	4-CF ₃	4-OCF ₃	169.5-172.0
64	0		H	H	H	O	3-CH ₃	4-CN	4-OCF ₃	193.9-195.2
65	0		H	H	H	O	3-CO ₂ CH ₃	4-CF ₃	4-OCF ₃	184.2-185.5
66	0		H	H	H	O	3-CO ₂ CH ₃	4-CN	4-OCF ₃	197.0-201.0
67	0		H	H	H	O	3-CN	H	4-OCF ₃	187.0-188.9
68	0		H	H	H	O	3-CN	4-CF ₃	4-OCF ₃	196.6-198.3
69	0		H	H	H	O	3-CN	4-CN	4-OCF ₃	245.7-248.8
70	0		H	H	H	O	3-NO ₂	4-CF ₃	4-OCF ₃	203.0-204.0
71	0		H	H	H	O	3-NO ₂	4-CN	4-OCF ₃	213.9-216.4
72	0		H	H	H	O	3,4-F ₂	4-CN	4-OCF ₃	199.0-199.5
73	0		H	H	H	O	3,5-F ₂	4-CN	4-OCF ₃	198.0-199.0

No. k	R ¹	R ²	R ³	R ⁴	W	X ₁	Y _m	Z _n	melting point (°C)
74	0	H	H	H	O	2,3-F ₂	4-CN	4-OCF ₃	194.0-195.5
75	0	H	H	H	O	2,5-F ₂	4-CN	4-OCF ₃	200.0-202.0
76	0	H	H	H	O	3-F	4-CN	4-Cl	200.0-202.0
77	0	H	H	H	O	3-F	4-CN	4-Br	198.0-199.5
78	0	H	H	H	O	3-F	4-CN	4-I	212.0-213.0
79	0	H	H	H	O	3-F	4-CN	4-CF ₃	200.0-201.0
80	0	H	H	H	O	3-F	4-CN	4-OCF ₂ H	194.0-195.0
81	0	H	H	H	O	3-F	4-CN	4-OCF ₂ CF ₂ H	178.0-179.0
82	0	H	H	H	O	3-F	4-CN	4-OCF ₂ CFHCF ₃	192.5-195.0
83	0	H	H	H	O	3-F	4-CN	4-SCF ₃	200.0-201.0
84	0	H	H	H	O	3-F	4-CN	4-OSO ₂ CH ₃	193.0-198.0
85	0	H	H	H	O	3-F	4-CN	4-CN	200.0-203.0
86	0	H	H	H	O	3-F	4-CN	4-CO ₂ CH ₂ CH ₃	204.0-205.5
87	0	H	H	H	O	3-F	4-CN	3-Cl	204.0-205.4
88	0	H	H	H	O	3-F	4-CN	3,4-Cl ₂	211.3-212.3
89	0	CH ₃	H	H	O	H	H	4-OCF ₃	163.0-165.0
90	0	CH ₃	H	H	O	H	4-CN	4-OCF ₃	207.0-209.0
91	0	CH ₃	H	H	O	3-F	4-CN	4-Cl	265.0-267.0
92	0	CH ₃	H	H	O	3-F	4-CN	4-CF ₃	221.5-222.5
93	0	CH ₃	H	H	O	3-F	4-CN	4-OCF ₃	210.0-213.0
94	0	CH ₃	H	H	O	3-CF ₃	4-CN	4-OCF ₃	101.0-103.0
95	0	CH ₃	H	H	O	3-CF ₃	4-CN	4-Cl	154.0-156.0
96	0	CH ₃	H	H	O	3-CF ₃	4-CN	4-SCF ₃	123.0-124.0
97	0	CH ₂ CH ₃	H	H	O	3-F	4-CN	4-OCF ₃	175.0-176.0
98	0	CH ₂ CH ₃	H	H	O	3-F	4-CN	4-OCF ₃	198.0-200.0
(isomer of No.97)									
99	0	CH ₂ CH ₂ CH ₃	H	H	O	3-F	4-CN	4-OCF ₃	139.6-142.3
100	0	C ₆ H ₅	H	H	O	3-F	4-NO ₂	4-OCF ₃	195.0-197.1
101	0	CH ₂ C ₆ H ₅	H	H	O	3-F	4-CN	4-OCF ₃	139.8-142.1
102	0	CH ₃	CH ₃	H	O	3-F	4-CN	4-OCF ₃	209.0-210.0
103	0	H	H	H	S	3-F	4-CN	4-OCF ₃	172.0-174.0
104	0	H	H	H	O	3-F	4-CN	4-CH(CH ₃)CH ₃	208.0-209.0
105	0	H	H	H	O	3-F	4-CN	*1	165.0-167.0
106	0	H	H	H	O	3-F	*1	4-OCF ₃	205.0-207.0

*1: 3,5-dichloro-4-(3-chloro-5-trifluoromethyl-2-pyridiloxy)

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FORMULATION EXAMPLES

Now, Formulation Examples will be given for pesticides containing compounds of the present invention as active ingredients. However, it should be understood
5 that the present invention is by no means restricted to such specific Examples. In the following Formulation Examples, "parts" means "parts by weight".

FORMULATION EXAMPLE 1: Wettable powder

	Compound of the present invention	50 parts
10	Zeeklite PFP (tradename for Kaoline-type clay, manufactured by Zeeklite Mining Industries Co., Ltd.)	43 parts
	Sorpol 5050 (tradename for anionic surfactant, manufactured by Toho Chemicals Ind. Co., Ltd.)	2 parts
	Lunox 1000C (tradename for anionic surfactant, manufactured by Toho Chemicals Ind. Co., Ltd.)	3 parts
15	Carplex #80 (antisolidification agent) (tradename for fine silica, manufactured by Shionogi & Co., Ltd.)	2 parts

The above components are uniformly mixed and triturerated to obtain a wettable powder.

FORMULATION EXAMPLE 2: Emulsifiable concentrate

20	Compound of the present invention	3 parts
	Xylene	76 parts
	Isophorone	15 parts
	Sorpol 3005X (tradename for a mixture of a nonionic surfactant and an anionic surfactant, manufactured by Toho Chemicals Ind. Co., Ltd.)	6 parts
25		

The above components are uniformly mixed to obtain an emulsifiable concentrate.

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FORMULATION EXAMPLE 3: Flowable

	Compound of the present invention	35 parts
	Agrisol S-711 (tradename for a nonionic surfactant, manufactured by Kao Corporation)	8 parts
5	Lunox 1000C (tradename for anionic surfactant, manufactured by Toho Chemicals Ind. Co., Ltd.)	0.5 part
	1% Rodopol water (tradename for a thickener, manufactured by Loan Puran)	20 parts
	Ethylene glycol (antifreezing agent)	8 parts
10	Water	28.5 parts

The above components are uniformly mixed to obtain a flowable.

FORMULATION EXAMPLE 4: Dry flowable

	Compound of the present invention	75 parts
15	Isoban No. 1 (tradename for an anion surfactant, manufactured by Klaray Isoprene Chemical K.K.)	10 parts
	Anilex N (tradename for anionic surfactant, manufactured by Sanyo Kokusaku Pulp K.K.)	5 parts
20	Carplex #80 (tradename for fine silica, manufactured by Shionogi & Co., Ltd.)	10 parts

The above components are uniformly mixed and finely pulverized to obtain a dry flowable.

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FORMULATION EXAMPLE 5: Granule

Compound of the present invention	0.1 part
Bentnite	55.0 parts
Talc	44.9 parts

- 5 The above components are uniformly mixed and triturerated. Then, a small amount of water is added thereto. The mixture is stirred, kneaded and then granulated by an extrusion-type granulator, followed by drying to obtain a granule.

10 FORMULATION EXAMPLE 6: Dust

Compound of the present invention	3.0 parts
Carplex #80 (tradename for fine silica, manufactured by Shionogi & Co., Ltd.)	
	0.5 part
Clay	95 parts
15 Diisopropyl phosphate	1.5 parts

 The above components are uniformly mixed and triturerated to obtain a dust.

- In use, the above wettable powder, emulsifiable concentrate, flowable or dry flowable is diluted from 50
20 to 20,000 times with water and applied so that the active ingredient will be from 0.05 to 50 kg/ha.

TEST EXAMPLES

- Now, usefulness of the compounds of the present invention as pesticides will be described in detail with
25 reference to the following Test Examples.

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TEST EXAMPLE 1: Insecticidal test on common cutworm
(Spodoptera litura)

5% emulsifiable concentrates of the compounds of the present invention (25% wettable powders in the case of certain compounds) were diluted with water containing a spreader to prepare the samples of liquid insecticides with a concentration of 1,000 ppm. Leaves of cabbage were immersed in the respective samples of liquid insecticides for about 10 seconds. After air drying, the leaves were placed in the Petri dishes and the second instar nymphae of common cutworm (Spodoptera litura) were released in the said dishes (10 insects per dish). The dishes were closed with a perforated cover and kept in a 25°C thermostatic chamber. The percentage of mortality of the insects after the lapse of 6 days was calculated by the following formula. The tests were conducted twice for each compound.

$$\text{Mortality (\%)} = \frac{\text{number of insects killed}}{\text{number of insects released}} \times 100$$

In the test results, the following compounds of the present invention exhibited a mortality of 100%.

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Compound Nos.: 3, 4, 5, 6, 9, 10, 11, 12, 13, 14, 15, 16, 17, 19, 20, 21, 22, 23, 24, 26, 27, 28, 29, 32, 33, 34, 35, 36, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 67, 68, 70, 72, 73, 76, 77, 78, 79, 80, 81, 82, 83, 85, 86, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 101, 102, 103.

TEST EXAMPLE 2: Insecticidal test on twenty eight-spotted ladybird (Epilachna vigintioctopunctata)

5% emulsifiable concentrates of the compounds of the present invention (25% wettable powders in the case of certain compounds) were diluted with water containing a spreader to prepare the samples of liquid insecticides with a concentration of 1,000 ppm. Leaves of tomato were immersed in the respective samples of liquid insecticides for about 10 seconds. Then, after air drying the leaves, they were placed in the Petri dishes and the second instar nymphae of twenty eight-spotted ladybird (Epilachna vigintioctopunctata) were released in the respective dishes (10 insects per dish). After covered, the dishes were kept in a 25°C thermostatic chamber. The percentage of mortality after the lapse of 6 days was calculated by the following formula. The tests were conducted twice for each compound.

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$$\text{Mortality (\%)} = \frac{\text{number of insects killed}}{\text{number of insects released}} \times 100$$

In the results, the following compounds of the

5 present invention exhibited a mortality of 100%.

Compound Nos.: 1, 2, 3, 4, 5, 6, 8, 9, 10, 11, 12, 1
 3, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 2
 6, 27, 28, 29, 32, 33, 34, 35, 36, 38, 39, 40, 4
 1, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 5
 10 3, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 6
 7, 68, 69, 70, 71, 72, 73, 74, 76, 77, 78, 79, 8
 0, 81, 82, 83, 85, 86, 88, 89, 90, 91, 92, 93, 9
 4, 95, 96, 97, 98, 99, 101, 102, 103.

The compounds of the present invention exhibit
 15 excellent insecticidal and miticidal activities against
 many agricultural insect pests and spider mites and no
 substantial adverse effects against mammals, fishes and
 beneficial insects. Thus, the compounds of the present
 invention present useful pesticides.

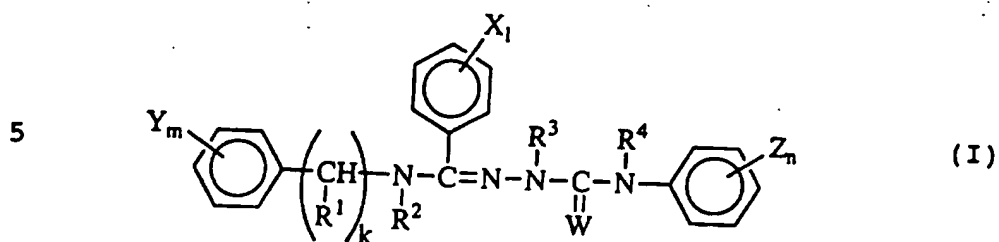
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CLAIMS:

1. A semicarbazone derivative of the formula (I):



wherein W is an oxygen atom or a sulfur atom;

- each of X, Y and Z which are independent of one another, is a halogen atom, a hydroxyl group, a cyano group, a nitro group, SCN, a trimethylsilyl group, R⁹, OR⁹, S(O)_pR⁹, OS(O)₂R⁹, OC(O)R⁹, C(O)R⁹, CO₂R⁹, C(O)N(R⁹)R¹⁰, SO₂N(R⁹)R¹⁰, NHC(O)R⁹, N(R⁹)R¹⁰, or -CH=CH-CH=CH-, -OCH₂O-, -OCH₂CH₂O-, -OCF₂O-, -OCF₂CF₂O- or -OCF₂CF₂- bridging the adjacent carbon atoms;
- 15

R¹ is a hydrogen atom, R⁵, a C₁₋₆ alkyl group which may be substituted by R⁵, or a phenyl group which may be substituted by (R⁵)_q;

- each of R², R³ and R⁴ which are independent of one another, is a hydrogen atom, a C₁₋₆ alkyl group, a C₂₋₆ alkenyl group, a C₂₋₆ alkynyl group, a C₁₋₆ haloalkyl group, a C₂₋₆ alkoxyalkyl group, a C₂₋₆ alkylcarbonyl group, a C₂₋₆ alkoxyalkyl group, a C₂₋₆ alkylcarbonyl group, a C₂₋₆ alkoxyalkyl group, a C₂₋₆ haloalkylcarbonyl group, a C₁₋₆ alkylthio group, a C₁₋₆ haloalkylthio group, R⁶OC(O)N(R⁷)S-, R⁷(R⁸)NS-, or a benzyl group which may be substituted by (R⁵)_q;
- 20
- 25

R⁵ is a halogen atom, a hydroxyl group, a cyano

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group, a nitro group, a C₁₋₆ alkyl group, a C₁₋₆ haloalkyl group, a C₁₋₆ alkoxy group, a C₁₋₆ haloalkoxy group, a C₁₋₆ alkylthio group, a C₁₋₆ haloalkylthio group, a C₁₋₆ alkylsulfonyl group, a C₁₋₆ haloalkylsulfonyl group, a C₂₋₆ alkoxy carbonyl group, an amino group, or a di C₁₋₆ alkylamino group;

each of R⁶, R⁷ and R⁸ which are independent of one another, is a C₁₋₆ alkyl group, a phenyl group which may be substituted by (R⁵)_q, or a benzyl group which may be substituted by (R⁵)_q;

R⁹ is a C₁₋₆ alkyl group, a C₁₋₆ haloalkyl group, a C₂₋₆ alkenyl group, a C₂₋₆ haloalkenyl group, a C₂₋₆ alkynyl group, a C₂₋₆ haloalkynyl group, a C₃₋₆ cycloalkyl group, a C₃₋₆ halocycloalkyl group, a C₄₋₇ cycloalkylalkyl group, a C₂₋₆ alkoxyalkyl group, a C₂₋₆ alkylthioalkyl group, a C₂₋₆ alkoxy carbonylalkyl group, a C₂₋₆ cyanoalkyl group, a phenyl group which may be substituted by (R⁵)_q, a benzyl group which may be substituted by (R⁵)_q, or a pyridyl group which may be substituted by (R⁵)_r;

R¹⁰ is a hydrogen atom, or a C₁₋₆ alkyl group;

k is an integer of from 0 to 2, provided that when k is 2, the plurality of R¹ may be the same or different;

ℓ is an integer of from 0 to 5, provided that when ℓ is from 2 to 5, the plurality of X may be the same or different;

m is an integer of from 0 to 5, provided that when m is from 2 to 5, the plurality of Y may be the same or

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different;

n is an integer of from 1 to 5, provided that when n is from 2 to 5, the plurality of Z may be the same or different;

5 p is an integer of from 0 to 2;

q is an integer of from 0 to 5, provided that when q is from 2 to 5, the plurality of R⁵ may be the same or different; and

10 r is an integer of from 0 to 4, provided that when r is from 2 to 4, the plurality of R⁵ may be the same or different.

2. The semicarbazone derivative according to Claim 1, wherein

15 X is a halogen atom, a cyano group, a nitro group, a C₁₋₆ alkyl group, a C₁₋₆ haloalkyl group, a C₁₋₆ alkoxy group, a C₁₋₆ haloalkoxy group, a C₁₋₆ haloalkylthio group, a C₁₋₆ haloalkylsulfonyloxy group, or a C₂₋₆ alkoxycarbonyl group;

20 Y is a halogen atom, a cyano group, a nitro group, a C₁₋₆ alkyl group, a C₁₋₆ haloalkyl group, a C₁₋₆ alkoxy group, a C₂₋₆ alkoxycarbonyl group, a C₁₋₆ haloalkoxy group, a C₁₋₆ alkylthio group, a C₁₋₆ haloalkylthio group, a C₁₋₆ alkylsulfonyl group, a C₁₋₆ haloalkylsulfonyl group, a C₁₋₆ alkylsulfonyloxy group, a C₁₋₆ haloalkylsulfonyloxy group, or -OCF₂O- or -OCF₂CF₂O- bridging the adjacent carbon atoms;

Z is a halogen atom, a cyano group, a nitro group, a

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C₁₋₆ alkyl group, a C₁₋₆ haloalkyl group, a C₁₋₆ haloalkoxy group, a C₁₋₆ alkylthio group, a C₁₋₆ haloalkylthio group, a C₁₋₆ alkylsulfinyl group, a C₁₋₆ haloalkylsulfinyl group, a C₁₋₆ alkylsulfonyl group, a C₁₋₆ haloalkylsulfonyl group, a C₁₋₆ alkylsulfonyloxy group, a C₁₋₆ haloalkylsulfonyloxy group, or -OCF₂O-, -OCF₂CF₂O- or -OCF₂CF₂- bridging the adjacent carbon atoms;

each of R¹, R³ and R⁴ which are independent of one another, is a hydrogen atom or a C₁₋₆ alkyl group;

R² is a hydrogen atom, a C₁₋₆ alkyl group, a C₂₋₆ alkenyl group, a C₂₋₆ alkynyl group, a C₁₋₆ haloalkyl group, a C₂₋₆ alkoxyalkyl group, a C₂₋₆ alkylcarbonyl group, a C₂₋₆ alkoxy carbonyl group, a C₂₋₆ haloalkylcarbonyl group, a C₁₋₆ alkylthio group, a C₁₋₆ haloalkylthio group, R⁶OC(O)N(R⁷)S-, R⁷(R⁸)NS-, or a benzyl group which may be substituted by (R⁵)_q;

each of *l* and *m* which are independent of each other, is an integer of from 0 to 2; and

n is an integer of from 1 to 3.

3. The semicarbazone derivative according to Claim 2, wherein

X is a halogen atom, a cyano group, a nitro group, a C₁₋₆ alkyl group, a C₁₋₆ haloalkyl group, a C₁₋₆ alkoxy group, a C₁₋₆ haloalkoxy group, or a C₂₋₆ alkoxy carbonyl group, and it is substituted at the 3-position, the 4-position, the 3- and 4-positions, or the 3- and 5-

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positions;

Y is a halogen atom, a cyano group, a nitro group, a C₁₋₆ alkyl group, a C₁₋₆ haloalkyl group, a C₁₋₆ alkoxy group, a C₁₋₆ haloalkoxy group, a C₁₋₆ alkylthio group, a C₁₋₆ haloalkylthio group, a C₂₋₆ alkoxy carbonyl group, or a C₁₋₆ alkylsulfonyloxy group, and it is substituted at the 3-position, the 4-position or the 3- and 4-positions; and

Z is a halogen atom, a cyano group, a C₁₋₆ alkyl group, a C₁₋₆ haloalkyl group, a C₁₋₆ alkoxy group, a C₁₋₆ haloalkoxy group, a C₁₋₆ alkylthio group, a C₁₋₆ haloalkylthio group, or a C₁₋₆ alkylsulfonyloxy group, and it is substituted at the 3-position, the 4-position or the 3- and 4-positions;

R² is a hydrogen atom;

each of R³ and R⁴ which are independent of each other, is a hydrogen atom, or a C₁₋₆ alkyl group;

k is 0;

each of ℓ and m which are independent of each other, is an integer of from 0 to 2; and

n is 1.

4. The semicarbazone derivative according to Claim 2, wherein

X is a halogen atom, a cyano group, a nitro group, a C₁₋₆ alkyl group, a C₁₋₆ haloalkyl group, a C₁₋₆ alkoxy group, a C₁₋₆ haloalkoxy group, or a C₂₋₆ alkoxy carbonyl group, and it is substituted at the 3-position, the 4-

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position, the 3- and 4-positions, or the 3- and 5-positions;

Y is a halogen atom, a cyano group, a nitro group, a C₁₋₆ alkyl group, a C₁₋₆ haloalkyl group, a C₁₋₆ alkoxy group, a C₁₋₆ haloalkoxy group, a C₁₋₆ alkylthio group, a C₁₋₆ haloalkylthio group, a C₂₋₆ alkoxy carbonyl group, or a C₁₋₆ alkylsulfonyloxy group, and it is substituted at the 3-position, the 4-position, or the 3- and 4-positions;

10 Z is a halogen atom, a cyano group, a C₁₋₆ alkyl group, a C₁₋₆ haloalkyl group, a C₁₋₆ alkoxy group, a C₁₋₆ haloalkoxy group, a C₁₋₆ alkylthio group, a C₁₋₆ haloalkylthio group, or a C₁₋₆ alkylsulfonyloxy group, and it is substituted at the 3-position, the 4-position, 15 or the 3- and 4-positions;

R² is a C₁₋₆ alkyl group, a C₂₋₆ alkenyl group, a C₂₋₆ alkynyl group, a C₁₋₆ haloalkyl group, a C₂₋₆ alkoxyalkyl group, a C₂₋₆ alkylcarbonyl group, a C₂₋₆ alkoxy carbonyl group, a C₂₋₆ haloalkylcarbonyl group, a C₁₋₆ alkylthio group, a C₁₋₆ haloalkylthio group, R⁶OC(O)N(R⁷)S-, 20 R⁷(R⁸)NS-, or a benzyl group which may be substituted by (R⁵)_q;

each of R³ and R⁴ which are independent of each other, is a hydrogen atom, or a C₁₋₆ alkyl group;

25 k is 0;

each of ℓ and m which are independent of each other, is an integer of from 0 to 2; and

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n is 1.

5. The semicarbazone derivative according to Claim 3, wherein

W is an oxygen atom;

5 X is a halogen atom, a C₁₋₆ alkyl group, a C₁₋₆ haloalkyl group, a C₁₋₆ alkoxy group, or a C₁₋₆ haloalkoxy group, and it is substituted at the 3-position;

Y is a halogen atom, a cyano group, a nitro group, a C₁₋₆ haloalkyl group, a C₁₋₆ haloalkoxy group, or a C₁₋₆ haloalkylthio group, and it is substituted at the 4-
10 position;

Z is a halogen atom, a C₁₋₆ haloalkyl group, a C₁₋₆ haloalkoxy group, or a C₁₋₆ haloalkylthio group, and it is substituted at the 4-position;

15 each of R³ and R⁴ is a hydrogen atom;

k is 0; and

each of ℓ , m and n is 1.

6. The semicarbazone derivative according to Claim 4, wherein

20 W is an oxygen atom;

X is a halogen atom, a C₁₋₆ alkyl group, a C₁₋₆ haloalkyl group, a C₁₋₆ alkoxy group, or a C₁₋₆ haloalkoxy group, and it is substituted at the 3-position;

Y is a halogen atom, a cyano group, a nitro group, a C₁₋₆ haloalkyl group, a C₁₋₆ haloalkoxy group, or a C₁₋₆ haloalkylthio group, and it is substituted at the 4-
25 position;

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Z is a halogen atom, a C₁₋₆ haloalkyl group, a C₁₋₆ haloalkoxy group, or a C₁₋₆ haloalkylthio group, and it is substituted at the 4-position;

each of R³ and R⁴ is a hydrogen atom;

5 k is 0; and

each of *l*, m and n is 1.

7. A pesticide which contains at least one semicarbazone derivative of Claim 1 as an active ingredient.

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INTERNATIONAL SEARCH REPORT

International Application No
PCT/JP 95/00623

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 C07C281/14 A01N47/34

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 C07C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
	-/--	

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

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- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
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- *&* document member of the same patent family

Date of the actual completion of the international search

27 June 1995

Date of mailing of the international search report

4. 07. 95

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INTERNATIONAL SEARCH REPORT

Internat. Application No
PCT/JP 95/00623

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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X	CHEMICAL ABSTRACTS, vol. 71, no. 7, 18 August 1969, Columbus, Ohio, US; abstract no. 30410, G. BARNIKOW, W. ABRAHAM 'Isothiocyanates. XXVI. Conversion of amidrazone with isothiocyanates' page 290 ; see abstract see RN 22821-21-2, Benzanilide, 4-(p-nitrophenyl)-3-thiosemicarbazone & Z. CHEM., vol.9, no.5, 1969 pages 183 - 184 ---	1
A	EP,A,0 462 456 (NIHON NOHYAKU CO.) 27 December 1991 see page 77, line 3 - line 48; claims ---	1,7
A	WO,A,92 06076 (E. I. DU PONT DE NEMOURS AND CO.) 16 April 1992 see page 58 - page 59; claims -----	1,7

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/JP 95/00623

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		KR-B- 9502840	27-03-95
		JP-A- 5017428	26-01-93

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		EP-A- 0553284	04-08-93
		JP-T- 6502414	17-03-94
